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ROBERT BUNSEN.

DIED AUGUST 16, 1899.

The death of Prof. Robert Wilhelm Eberhardt Bunsen, at Heidelberg, August 16th, marks the passing away of the last of the great German chemists of the older school. Liebig, Wöhler, Hofmann, Kopp and Fresenius had all preceded him, and now, at the ripe age of 88, Bunsen, known better by name, at least, to every laboratory student throughout the civilized world, has followed them.

Bunsen was born March 31, 1811, at Göttingen, where his father was a professor of Oriental Literature. His special branches of study at the university were chemistry, physics and zoology. After graduation he continued his studies at Paris, Berlin and Vienna, and in 1833 began his career as lecturer on chemistry at Göttingen. He became a professor of chemistry at the Polytechnic School at Cassel in 1836, removing to Marburg in 1838, to Breslau in 1851, and to Heidelberg in 1852, where the remainder of his fruitful life was spent. How fruitful in results his career was to the science of chemistry a brief review of the most important of his discoveries will show.

His first considerable investigation was that upon alkarsin (fuming liquid of Cadet), in 1833 and following years, which resulted in the discovery of cacodyl and the compounds of arsendimethyl, the first of the organo-metallic radicals, as well as the suggestion on his part of ferric hydrate as the most efficient antidote for arsenic poisoning. In 1838 and 1839 he published studies on the composition

of the gases of the blast furnace process, which had the very important result of showing their value for fuel, thus pointing out the means of effecting an enormous saving to the ironmaster, as well as of improving his whole process. Incidentally this opened the way for his later studies on gasometric analysis, which branch of investigation he may be said to have created and brought to the highest perfection.

ROBERT BUNSEN.

In 1840 came the invention of the Bunsen battery cell, replacing the platinum of the Grove cell by the cheaper element, carbon, as well as gaining in electro-motive force. In this connection we may state that the suggestion for the use of acidified bichromate of potash in the one liquid cell is also said to have been made by Bunsen, although the form in current use is known as the Poggendorf cell. With a large battery of the zinc-carbon cells, Bunsen began, in

1844, his studies of the arc light, obtained with different metals volatilized at the electrodes, viewing these colored flames with a prism and noting the characteristic bright lines obtained. This was developed more fully by him in 1859, when, in association with Kirchhoff, he announced the principles of spectrum analysis and invented the spectroscope. Meanwhile he carried out prolonged studies on the electrolytic production of the alkali and alkaline earth metals, obtaining some of them for the first time in a state of purity. In 1861 he announced the discovery of the metals cæsium and rubidium as a result of the application of spectroscopic methods of analysis. One of the special benefits conferred upon a chemical world by this great master was the invention of convenient forms of laboratory apparatus. We need only mention the Bunsen burner, the Bunsen battery cell, the Bunsen filter pump for rapid filtration, the spectroscope, and apparatus for gas analysis.

In person, Bunsen was tall and of a swarthy complexion. He had lost the use of one eye by an explosion in connection with his cacodyl research. Bunsen was never married. When a young professor at Marburg he had joined with a young English chemist, Lyon Playfair (afterwards Lord Playfair), in making an elaborate study of the blast furnace process, and for this purpose the two young chemists spent some months in Scotland, living in the house of a wealthy ironmaster. Both were smitten with the daughter of their host, but she became Mrs. Playfair, so Bunsen went back to Germany single, and so he remained to the end. But he became the centre of a circle of devoted friends at Heidelberg, and so remained during more than a generation of active, fruitful life.

S. P. S.

ASPIRIN, OR ACETYL-SALICYLIC ACID.—Wohlgemuth (*Therap. Monatshefte*, May, 1899) has tested some of the compounds of salicylic acid. By the action of anhydrous acetic acid on salicylic acid he obtained white crystals of acetyl-salicylic acid, readily soluble in alcohol or ether, and to the extent of 1 per cent. in lukewarm water. The drug does not decompose in the stomach until it has been there two or three hours, so that it is, to a great extent, passed into the intestine unchanged, and does not irritate the gastric mucous membrane, as does salicylate of soda, which is decomposed almost as soon as it enters the stomach. The alcoholic solution of the new compound, aspirin, having such a bad taste, the drug was usually given in capsules. Its therapeutic effects are identical with those of salicylic acid, except that disagreeable gastric symptoms are almost entirely done away with.—Abstract in *Medical News*, August 12, 1899.

DIRECTIONS FOR CERTAIN ALKALOIDAL ASSAYS.[1]

By H. M. Gordin and A. B. Prescott.

A General Method for the Extraction of Alkaloids in Assays.

I.—as a method by percolation.[2]

One to four grammes of the finely powdered drug is weighed into a low wide-mouthed vessel, with a round bottom, holding 8 or 10 ounces, and having a well-fitted cork, such as a screw-top ointment jar.[3] The powder is rubbed up with a small pestle to a fine paste, by adding a little of a solvent mixture, composed of stronger ammonia water and alcohol, each 5 c.c., chloroform, 10 c.c., and ether, 20 c.c.[4] Then a few more cubic centimeters of this mixture are added, so as to have the drug well covered with the liquid, using in all about five times the amount of the drug taken. The vessel is corked, with the pestle inside, and is set aside for about four or five hours, taking care to agitate by circular movement very frequently during that interval. After that time the cover is removed, and the vessel kept in a current of air, stirring frequently till all odor of ammonia has disappeared. With a good draught and frequent stirring, the powder will be almost perfectly dry in about one hour. The vessel is then put into a vacuum desiccator over sulphuric acid for about four or five hours.

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[1] In the work of Research Committee D, Section 2, Committee on Revision and Publication of the Pharmacopœia of the United States, 1890–1900. Read at the meeting of the American Pharmaceutical Association, September, 1899.

[2] These directions were published, nearly as here given, by the authors, in an article, "Emetine Octoiodide," etc., *Pharm. Review*, Vol. 17, 1899. This general method is not applicable to Ipecacuanha. See under "Assay of Ipecacuanha," further on.

[3] An ordinary teacup fitted with a specie cork answers well.

[4] In the case of Hydrastis canadensis the chloroform is replaced by an equal volume of ether.

Note.—Analytical results in support of these directions were given in an accompanying paper, "Further Work Upon the Estimation of Alkaloids and the Assay of Alkaloidal Drugs," presented to this Association at the same date. Also, in the paper entitled "Certain Alkaloidal Periodides, and the Volumetric Estimation of Alkaloids as Higher Periodides," by the same authors, "Proc. Am. Phar. Assoc.," 1898, p. 340; *Pharm. Arch.*, I, p. 121; *Jour. Am. Chem. Soc.*, 1898, p. 724. A paper on "Hydrastine Hexiodide and Assay of Hydrastis," Am. Jour. Pharm., 1899, p. 257. Further, see the article "The Periodides of the Alkaloids as Molecular Forms for Estimation," etc., by A. B. Prescott, 1897, *Pharm. Review*, Vol. 15, and other papers since 1895.

An amount of powdered sodium chloride,[1] equal to about five or six times the amount of drug employed, is then carefully mixed in, with use of the pestle, and the whole thrown into a small percolator, one provided with a glass stop-cock and having a plug of cotton at the bottom.[2]

The vessel is then cleaned out several times with small quantities of sodium chloride, and the cleanings added to the percolator. The mixture in the percolator is then covered with a little of the cotton, which is pressed down with a piece of glass, and a suitable menstruum, usually chloroform, is poured slowly into the percolator, till the menstruum reaches the stop-cock. The latter is then closed, the percolator covered and set aside for five or six hours. After that time the stop-cock is opened, and the drug exhausted with the menstruum, percolating until ten drops of the percolate being evaporated on a watch-glass, and the residue taken up with a few drops of acidulated water, the solution shows no turbidity whatever on adding a few drops of the solution of iodine. When finished, the percolate, which is received in a flat evaporating dish, is placed in a good draught at a temperature of about 30° C. When the liquid is reduced to a very small volume, 10 c.c. of acidulated water[3] are added, and then a few cubic centimeters of ether, or petroleum ether, so as to have an ethereal liquid cover the aqueous solution,[4] when the whole is stirred with a glass rod until all the ethereal liquid is driven off. The liquid is then filtered, and the evaporating dish and filter washed several times with acidulated water. In this way is obtained a colorless solution of the alkaloid, which can be worked up for any method of estimation.[5]

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[1] In the case of Hydrastis the sodium chloride is replaced by barium nitrate.

[2] A suitable percolator is easily made out of an ordinary piece of glass tubing fitted with a perforated cork, through which passes a tube having a glass stop-cock.

[3] If an alkalimetric assay is intended, the acidulated water in the operation should be closely standardized and taken in definite quantities.

[4] If the menstruum is all evaporated off it is sometimes difficult to dissolve out the alkaloids with the acidulated water. If chloroform be used, coming below the aqueous layer, it evaporates too slowly.

[5] The method of extraction described above presents particular advantage in those cases where several alkaloids soluble in different menstrua are present in the drug, as by using these menstrua successively a separation of the alkaloids can be easily effected. This principle we have applied to the assay of opium, and to that of Hydrastis canadensis.

II.—AS A HOT EXTRACTION METHOD.

Instead of the cold percolation, as above directed, hot extraction in any suitable apparatus may be used, all other features of the operation being the same. If a Soxhlet tube is used, care should be taken that the syphon works intermittently, as otherwise the extraction is very incomplete; if Dunstan and Short's apparatus[1] is used, the boiling of the solvent should be so regulated as to have always a layer of about 2 centimeters of it on the top of the drug. Our experience has taught us that for quantitative work cold extraction by percolation requires less skill and care than hot extraction in a Soxhlet tube, though with careful operation the latter method is preferable.

THE VOLUMETRIC ESTIMATION OF ALKALOIDS BY PRECIPITATION WITH FREE IODINE.[2]

Estimation by Formation of a Periodide, so far Applied to Atropine, Morphine, Strychnine, Brucine, Emetine, Hydrastine and Caffeine.

For opium assay, see p. 466.

For assay of nux vomica, with separation of strychnine from brucine, see p. 470.

For assay of ipecac, see p. 472.

For estimation of berberine in assay of hydrastine, see p. 472.

For estimation of caffeine, the alkaloidal solution must be invariably acidulated (Gomberg, 1896). For assay of kola, see Knox and Prescott, 1896–97, "Proc. Am. Phar. Assoc.," *44*, p. 128, and *45*, p 131; *Jour. Am. Chem. Soc.*, *19*, p. 63; *20*, p. 34.

The Reagents and Utensils Required in the Volumetric Work.

(1) A standardized solution of iodine dissolved in water with iodide of potassium to be of about decinormal strength (12·653 grammes of free iodine in 1,000 c.c.). The solution may be made as the volumetric test solution of iodine of the U.S.P., and used with the exact decinormal factor of iodine if preferred.

(2) A solution of sodium thiosulphate, of about decinormal strength, standardized to known ratio with the iodine solution. The

[1] *Pharm. Jour.* (3), xiii, 664.

[2] These directions were given in substance in an article entitled "Emetine Octoiodide and the Estimation of Alkaloids Generally," by the authors of this paper, in *Jour. Am. Chem. Soc.*, *21*, p. 234, March, 1899; *Pharm. Review*, Vol. 17, 1899.

Volumetric Test Solution of Thiosulphate of the U.S.P. may be used.

(3) The Starch Test Solution of the Pharmacopœia.

(4) The burettes and centesimal measuring vessels for any volumetric work in analysis.

THE VOLUMETRIC OPERATION.

The final alkaloidal solution obtained by whatever mode of extraction,[1] but always representing a definite quantity of the drug to be assayed, is poured slowly and with constant stirring into a flask holding 100 c.c., in which has been previously drawn 20 or 30 c.c. of the standardized solution of iodine, and 1 or 2 c.c. of dilute hydrochloric acid[2] (U.S.P.). The flask is then filled up to 100 c.c., stoppered, and well shaken till the periodide has separated out. The supernatant liquid is to be perfectly transparent, but of a red iodine color. Fifty c.c. are then filtered off, and in this portion the excess of iodine determined by means of standard sodium thiosulphate. The amount of iodine consumed, multiplied by the proper factor, gives the amount of alkaloid present in the quantity of drug taken.[3]

In case more than one alkaloid be present in the drug, a *mean iodometric* factor can be drawn, as shown for strychnine and brucine in the list of factors. In alkalimetric estimations a mean factor is often used in assay for total alkaloids, and the same is equally justifiable in iodometric work, when the data are known.

Should there be no precipitate with iodine, but only a slight turbidity, then the drug is extremely poor, and for the assay a much larger quantity than has been used should be taken. On the other hand, should the supernatant liquid, after adding the alkaloidal solu-

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[1] Directions for extraction are given further on. Other procedure for extraction is given in Lyons' "Handbook of Assaying," 1899, Detroit, Nelson, Baker & Co., pages 26 to 30.

[2] It is always to be remembered that this estimation, by formation of *higher* periodides, requires the alkaloid to be added slowly *to* the iodine, with excess of the latter. Except in the case of morphine, an excess of acid is not hurtful, and even promotes the separation of the periodide. Hydrochloric is to be preferred to sulphuric acid.

[3] For example: If operating upon 2 grammes of powdered ipecac root, the iodine consumed be 0·957764, then the *percentage* of emetine in the drug equals $0{\cdot}957764 \times 0{\cdot}55 \times 100/2 = 2{\cdot}63$.

tion to the solution of iodine and separating the periodide by shaking, have very little color, or be almost colorless, then it is certain that the drug is very rich, and either a smaller quantity of the drug or a larger quantity of the iodine solution must be employed in the assay.

Generally, if the drug contains as much as 3 per cent. of alkaloid, 1 gramme should be taken for the assay; if it contains less than the above amount, but not less than $\frac{2}{10}$ of 1 per cent. of alkaloid, then a quantity between 1 and 5 grammes should be taken.

THE IODINE FACTORS.

The Precipitate Formed.	Quantity of Alkaloid to 1·0000 of Iodine Consumed.	Quantity of Alkaloid to 1 C.c. of Tenth-normal Solution of Iodine.[1]
Atropine, $C_{17}H_{23}NO_3.HI.I_8$	0·285	0·00361
Morphine, $C_{17}H_{19}NO_3.HI.I_3$	0·749	0·00948
Strychnine, $C_{21}H_{22}N_2O_2.HI.I_6$	0·439	0·00556
Brucine, $C_{23}H_{26}N_2O_4.HI.I_6$	0·518	0·00655
Mean of strychnine and brucine	0·478	0·00605
Emetine,[2] $C_{28}H_{40}N_{20}O_5.HI.I_7$	0·55	0·006
Hydrastine, $C_{21}H_{21}NO_6.HI.I_5$	0·604	0·00764
Caffeine, $C_8H_{10}N_4O_2.HI.I_4$	0·383	0·00485

THE ASSAY OF OPIUM.

The Extraction of the Morphine and its Volumetric Estimation Either by Standardized Solution of Acid or by Standardized Solution of Iodine.[3]

For the use of *hot extraction instead of cold percolation* in treatment of the opium in this process, see the accompanying article,

[1] If the analyst prefers to standardize his volumetric solution of iodine to exact decinormal strength, or to adjust the consumption of iodine to this strength by use of a correcting factor, then he will multiply the cubic centimeters of iodine solution consumed by the proper factor in this column. (1 c.c. decinormal solution contains 0·012653 gramme of iodine.) The more simple way, however, is to register the actual quantity of iodine in 1 c.c. of the solution, be the same above or below the 0·012653 gramme, and multiply this actual quantity by the number of cubic centimeters used up, so as to get the *weight* of iodine consumed. This, multiplied by a factor of the first column above, gives the quantity of alkaloid estimated, in grammes.

[2] That is, a provisional representative of the total alkaloids of ipecacuanha.

[3] This method of assay with the iodometric estimation appeared in its primary form, with the analysis of morphine tetraiodide, etc., in an article by the present authors, in June, 1898 (*Pharm. Archives*, I, p. 121), and with some additions in "Proc. Am. Phar. Assoc.," 1898, p. 340 (also in *J. Am. Chem. Soc.*, 1898, p. 724). The directions with adaptation to the alkalimetric way of estimation, as here given, formed a part of "The Assay of Opium: A Supplementary Note" in the *Pharmaceutical Review*, *17*, 1899, and to appear in the *Archiv der Pharmacie.*

"Further Work Upon the Estimation of Alkaloids," in which also are included a few results in comparison with the U.S.P. method, and a brief discussion of the subject.

THE MATERIALS AND UTENSILS FOR THE ASSAY.

Opium in very fine powder. Powdered sodium chloride, such as is used for the table. An ethereo-ammoniacal mixture composed of stronger ammonia water (U.S.P.) and alcohol, of each 5 c.c.; chloroform (U.S.P.), 10 c.c., and ether, 20 c c. Benzol boiling at about 80° C. A mixture of one volume of absolute alcohol and five volumes of chloroform. Twentieth normal sulphuric acid and twentieth normal potassium hydrate solution. Neutral methyl-orange paper. Standard solution of iodine, of any known strength in the neighborhood of 1 per cent., and standard solution of sodium thiosulphate of about twentieth normal strength.

A four or six ounce screw-top ointment jar, having a bottom concave within. A small pestle, just long enough to rest half upright within the jar when it is closed. A small glass percolator provided with a stop-cock, and of the length of about 22 centimeters and inner diameter of about 1·3 centimeters.[1]

DIRECTIONS FOR THE ASSAY.

Weigh out 3 grammes of the opium into the ointment jar, rub it up by means of the pestle with a few cubic centimeters of the ethereo-ammoniacal mixture to make a fine paste, taking care not to smear the sides of the jar unnecessarily, then add about 2 c.c. more of the same mixture, so as to have the opium well covered with liquid, screw down the top, leaving the pestle inside, and set the jar aside for five or six hours. After that time the jar is opened, about 10 grammes of the sodium chloride thoroughly mixed in with the opium, and the open jar placed in a good current of air, stirring frequently with the pestle in order to prevent formation of lumps. In about an hour the powder will be nearly dry. The jar is then placed in a vacuum desiccator containing, besides sulphuric acid, a vessel of paraffin, and left there over night. The jar is then taken out, any lumps in the powder carefully crushed with the pestle, and the mixture transferred first to the glazed paper, and then to the

[1] The lower part of a burette cut in two answers very well.

percolator, in the bottom of which a plug of cotton has been placed. The jar is rubbed out several times with small quantities of the sodium chloride, the rinsings added to the percolator, and, having placed a plug of cotton and a piece of glass on the top of the powder, the opium is extracted with benzol by percolating very slowly, until, upon evaporating ten drops of the percolate on a watch-glass, and taking up the residue with ten or twelve drops of very slightly acidulated water, no turbidity appears by the addition of two drops of the iodine test solution. After the narcotine, thebaine, codeine and most other alkaloids have in this way been completely removed by the benzol, the receiver is taken away[1] and a shallow evaporating dish placed under the percolator.

The percolation is now continued slowly with the mixture of alcohol and chloroform,[2] until ten drops of the percolate, tested as above, give no reaction for alkaloids. The evaporating dish is now put into a good current of air, and left over night,[3] or until the solvent has disappeared. The bottom of the dish will then be found to be covered with a good crop of crystals intermixed with a little resinous matter.

ESTIMATING IN THE ALKALIMETRIC WAY.

Fifty c.c. of the twentieth normal sulphuric acid are now carefully run out from a burette into the evaporating dish, the contents rubbed well with a pestle till everything is detached from the bottom and sides of the dish, and then, without filtering, poured into a tall, narrow measuring cylinder. The dish is then carefully washed several times with small quantities of water, the washings added to the cylinder, and the latter filled up to make 90 c.c. After shaking well a few minutes, and setting aside till solid particles have settled down,[4] 75 c.c., representing 2½ grammes of the opium, are filtered off into a beaker holding some 250 or 300 c.c., about 50 c.c. of water added, and then 35 or 40 c.c. of the twentieth normal potassium hydrate run out from a burette into the beaker. Twen-

[1] The benzol, of course, can be recovered by distillation, and used over and over again.

[2] See Burg, *Ztschr. anal. Chem.*, 19, p. 222.

[3] This makes the whole assay occupy about two days and two hours, if it be started in the morning.

[4] The filtration is much accelerated if the waxy particles are prevented from entering the filter.

tieth normal sulphuric acid is now carefully added, 1 c.c. at a time, stirring with a glass rod and testing the liquid after each addition by immersing for about fifteen seconds small strips of neutral methyl-orange paper. As soon as the paper becomes reddish, 1 c.c. of the potassium hydrate solution is added, and then again of the sulphuric acid, adding now $\frac{1}{10}$ of a c.c. of the latter at a time, till the paper becomes reddish. In order to get exact results, the acid and alkali solutions should be standardized in nearly the same conditions under which the titration of morphine takes place, that is, using about 175 c.c. of liquid, and noting the appearance of the reddish tint upon the test paper at the point of neutrality. The strips of reagent paper should, of course, be wet with the wash-bottle before immersion in the beaker. Though the solution of morphine has a yellow color from some extractive matter, so that the end-reaction cannot be found by adding a liquid indicator to the solution, there is not the slightest difficulty in noting the appearance of the reddish tint upon the cream-colored methyl-orange paper. Of course, other indicators, like iodo-eosin in ethereal solution, etc., might be found to give equally good results, but having found the dip test with methyl-orange paper to give sharp and definite results with this alkaloid, we have not experimented upon other indicators.

One c.c. of twentieth normal acid being equivalent to 0·0142 gramme anhydrous morphine, the number of cubic centimeters of the acid consumed by the alkaloid from 2½ grammes opium, multiplied by 0·568 ($= 0{\cdot}0142, \frac{100}{2.5}$), gives the percentage of morphine in the opium.

ESTIMATING IN THE IODOMETRIC WAY.

When it is desirable *to control* the alkalimetric assay with an iodometric one, the contents of the beaker are emptied in a 250 c.c. measuring flask, washing the beaker two or three times with small quantities of water, the flask filled up to 250 c.c., about 3 or 4 grammes calcium hydrate added, and the mixture shaken for about an hour. This treatment removes a good deal of the coloring matter, but keeps the morphine in solution. Fifty c.c., which represent ½ gramme of opium, are now filtered off into a 100 c.c. flask, and the liquid slightly acidified with hydrochloric acid. The liquid will now be only slightly colored. Twenty c.c. of the standard iodine are now run out from a burette into the flask, the latter filled

up to 100 c.c., and the flask well shaken till the supernatant liquid becomes perfectly transparent, but has a dark-red iodine color.[1] Fifty c.c. are now filtered off and the excess of iodine determined by the standard sodium thiosulphate, using starch as indicator. The amount of iodine consumed by the ½ gramme of opium, multiplied by 149·8 (= 0·749 × 100 × 2),[2] gives the percentage of morphine in the opium.

If only an iodometric assay be desired, but 1 gramme opium need be taken for the assay, and the latter conducted exactly as described above up to the point where the chloroform-alcohol has been removed by evaporation. At this point the residue is taken up with good lime water by rubbing the evaporating dish thoroughly with it, pouring the mixture in a 100 c.c. flask, filling the latter up with lime water to make 100 c.c., shaking the flask about an hour, filtering off 50 c.c. into another 100 c.c. flask, acidulating and then finishing up as above.

THE ASSAY OF NUX VOMICA.[3]

The acidulated water solution of the total alkaloids of the drug, as obtained by the directions on page given above, or other method of extraction, is made up to a definite volume, say 100 c.c. If 4 grammes of the drug have been taken, then 25 c.c. will represent 1 gramme of the drug, and will be sufficient for one estimation. This volume, then, is run from a burette into a 100 c.c. flask in which has been placed 20 c.c. of the decinormal iodine solution and 2 c.c. dilute hydrochloric acid, when the amount of iodine consumed by the total alkaloids in that 1 gramme of nux vomica is reached in the way described above. Let that amount be *a*. If only the amount of total alkaloids in the nux vomica is desired, it is sufficient to multiply *a* by 47·8, which is equal to 100 times the mean factor of strychnine and brucine, and the *percentage* of total alkaloids is at once obtained.

For the separate estimation of strychnine and brucine, a modifica-

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[1] See our article in *J. Am. Chem. Soc.*, 1898, p. 722; "Proc. Am. Phar. Assoc.," 1898, p. 368.

[2] 0·75 is here taken instead of 0·74914, which is the factor for morphine (*Loc. cit.*, p. 724).

[3] From an article by the authors in *Pharm. Review*, Vol. 17, 1899.

tion of Dunstan and Short's[1] method of separation by ferrocyanide we have found to work fairly well, as follows: Another portion of the alkaloidal solution, representing 2 grammes of the nux vomica, that is, 50 c.c., is run out from the burette into an Erlenmeyer flask of the capacity of about 300 c.c., and to the contents of the flask 10 c.c. of a 2 per cent. solution of sulphuric acid is added, and then water enough to make in all about 200 c.c. Then pour in 25 c.c. of a 5 per cent. solution of potassium ferrocyanide, stopper the flask, and shake continuously for about half an hour. Now filter, wash the precipitate on the filter repeatedly with water containing 1 per cent. of sulphuric acid till a few drops of the filtrate diluted with a little water have no bitter taste. The filter is then pierced, and the precipitate rinsed with use of the wash-bottle into a 100 c.c. flask. To the contents of the flask are then added 20 c.c. of a 5 per cent. solution of zinc sulphate, and the flask kept on a boiling water-bath for about fifteen minutes. The zinc sulphate decomposes the strychnine ferrocyanide, zinc ferrocyanide is precipitated, and strychnine sulphate remains in solution. The flask is then completely cooled, and water enough added to make 100 c.c. Of this, 50 c.c., representing again 1 gramme of the nux vomica, but deprived of the brucine, are then filtered off and run out from the burette into a 100 c.c. flask containing 20 c.c. decinormal iodine solution and about 2 c.c. of dilute hydrochloric acid. The amount of iodine consumed by the strychnine alone is then determined as above. Let it be b. Then $b \times 43{\cdot}9$ (100 times the strychnine factor) gives the percentage of strychnine, and $(a - b) \times 51{\cdot}8$ is the percentage of brucine in the nux vomica.[2]

	Iodine Consumed by 10 C.c. before the Removal of Brucine.	Iodine Consumed by 10 C.c. after the Removal of Brucine.	Found. Strychnine.	Found. Brucine.	Contained. Strychnine.	Contained. Brucine.
1	0·0843132	0·032397	0·14	0·24	0·16	0·22
2	0·0843130	0·032397	0·14	0·24	0·16	0·22

[1] *Pharm. J. Trans.* (3), 14, 290; AM. J. PHARM., 1883, 579. Any other method of separation of strychnine and brucine may be used with the iodometric estimations.

[2] To test the exactness of this method, we prepared a solution containing known quantities of each of these alkaloids, and determined the same by the described method. The results, as can be seen from the following statement, are fairly satisfactory, if we consider the well-known difficulties of this separation. The solution contained 0·16 per cent. strychnine and 0·22 per cent. brucine (anhydrous).

ASSAY OF IPECACUANHA.

For extraction of the drug, use one of the methods given in Lyons' "Assaying."[1] The cold percolation process of extraction previously directed, as already remarked, does not work well with this drug.[2]

In iodometric estimation the total acidulated alkaloid solution is made up to a definite volume, an aliquot portion taken, and added to a measured excess of the iodine solution, as directed heretofore. The iodine factor of emetine is taken as fairly near the mean factor of the total alkaloids.

ASSAY OF HYDRASTIS.

In the assay of *Hydrastis canadensis*, for berberine and for hydrastine, the directions for the assays are given in the accompanying article entitled "Further Work Upon the Estimation of Alkaloids," etc. In the plan of the assay the hydrastine is dissolved with absolute ether, and estimated iodometrically as a hexiodide. The berberine, undissolved by the absolute ether, is estimated volumetrically by precipitation as berberine hydriodide, the excess of the precipitant, potassium iodide, being determined by silver nitrate with sulphocyanate. But before the berberine is precipitated as hydriodide, it is separated in its acetone compound. And before the alkaloids are acted upon by the reagents, they are liberated from the powdered drug by maceration with an ethereo-ammoniacal mixture.

THE DESTRUCTION OF MOSQUITOES WITH KEROSENE.—An interesting experiment, confirmatory of the efficacy of the plan proposed by Mr. Howard, of the United States Department of Agriculture, for exterminating those vexatious vehicles of malaria, mosquitoes, was recently made in England, as we learn from the *British Medical Journal* for July 8th. Five drops of kerosene, added to a bucket of water estimated to contain between four and five hundred larvæ, killed them all within an hour, and a teaspoonful killed, within a few hours, the many thousands contained in the water of a tank of nearly three hundred cubic feet capacity.—*New York Medical Journal.*

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[1] Detroit, 1899.

[2] Ether, chloroform and acetone were tried as menstrua in the cold percolation, but the results were too low. The ammoniated mixture fails to yield all the alkaloid. This possibly explains why Flückiger,* extracting by ammoniated chloroform, obtained exceptionally low results. See also Guareschi, "Alkaloide," 1896, p. 527.

*Pharm. Zeitung, 1886, p. 30.

IS PHYSIOLOGICAL ACTION REQUISITE AS A DEPARTMENT OF PHARMACEUTICAL RESEARCH?[1]

By E. M. Houghton, Ph.C., M.D.

If by the query, as propounded by the Committee on Scientific Papers, it is intended to express the idea that in order to accomplish results of the greatest value to the pharmaceutical and medical professions and to humanity at large, through the manufacture of better and more uniform pharmaceutical products from old and tried drugs, through the improvement of processes for the isolation of active constituents, or through the exhaustive investigation of the action of new medicinal substances, by the employment of physiologic methods in addition to the methods usually employed in pharmaceutical research, I desire to offer the following views, some of which were expressed several years ago. (*The Journal of Am. Med. Assoc.*, April 3, 1897.)

In the practice of medicine it is of paramount importance that the remedies prescribed shall exhibit their special pharmacologic properties, and that such action shall be as nearly uniform as possible; otherwise, the greatest harm may result to the patient through valuable time lost or improper dosage. One of the most humiliating charges against the science of medicine is the one so frequently voiced that "the application of drugs in the treatment of disease is, at best, uncertain and unscientific." It is because the great imperfections in the present methods of treating disease are realized by scientific men that such great efforts are being put forth throughout the civilized world, by the application of every conceivable method, to improve pharmaceuticals and to discover the relations that exist between the physiologic action of the body in its normal condition (physiology) and the changes in function of the various organs manifested when under the influence of drugs (pharmacology), or when modified by the products or processes of disease (pathology), in order that medicinal agents may be applied with the greatest certainty of effect. As a direct result of these efforts, and especially because of the application of laboratory methods, the progress of pharmacy and medicine has been greater during the last twenty-five years than in the entire century preceding.

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[1] Read before the American Pharmaceutical Association, at Put-in-Bay, September 6, 1899.

Chemical methods should always be employed in preference to animal experiments where possible; but there is a large class of drugs containing active constituents about which little is known, or which are of such a delicate nature that decomposition results when they are subjected to chemical manipulations, consequently it is impossible to standardize them by ordinary means. I refer to Indian cannabis, ergot, and especially to the heart tonics of the digitalis group, etc. No directions are given in the U.S.P. for the assay of these substances, yet the most poisonous drugs employed in therapeutics belong to the digitalis series. As given by several of the best authorities, the maximum dose of belladonna is twice as great as that of digitalis, while ten times as much absolute HCN can be given with safety as of strophanthin.

Brunton found, by experiments upon animals, that amyl nitrite dilates the arterioles and lowers blood pressure, and recommended the drug in angina pectoris. His recommendation, as is well known, has been confirmed by abundant clinical experience. Through the exhaustive researches of Schmiedeberg and others, the rational application of digitalis and the rest of the heart tonics has been rendered possible.

We must give the biological laboratory entire credit for explaining the cause of the infectious diseases, and for the revelation of nature's remedy and the perfection of processes for manufacturing the antitoxins. This is the most important discovery in medicine ever made, and bids fair to revolutionize the treatment of many diseases that have heretofore defied the power of all drugs. It is not my purpose, however, to speak at length of the relation of the pharmacist to the antitoxins, as my time is too short, but it seems to me that more attention should be paid by pharmacists to these products, which are so rapidly supplanting older remedies.

Too often, in the manufacture of pharmaceuticals, physiologic activity has been sacrificed to enhance the elegance or lessen the cost of the preparation. Podwissotsky and Dragendorff concluded from insufficient experimental data that sclerotinic acid was the most desirable constituent of ergot, and, since it is readily soluble in water, numerous manufacturers made aqueous preparations of the drug. After several years of pharmacologic study of ergot, I am satisfied that Kobert, Jacobi, etc., are right in their conclusion that sclerotinic acid as an oxytocic is worthless; large doses of it

and of certain preparations of ergot, made with an aqueous menstruum, and therefore containing it, may be administered to pregnant animals without producing abortion, or to fowls without producing blackening or gangrene of the comb or other peripheral parts. It is a well-established fact that ergot may become quickly inert if improperly cured or stored. Indeed, if physiologic examination be made of the supplies of ergot offered for sale on the market, it will be found that a large proportion are comparatively inert.

Pharmacologic experiments are of special importance in the isolation of active glucosides. "Several years ago there was isolated a beautiful white scillein, which was supposed to be the active constituent of squill. But since then it has been found to be entirely inert, and that the really important constituent of squill is a brown resin-like substance, possessing in a very marked degree the characteristic action of the digitalis group."

The various samples of strophanthin, digitalin, and other glucosides found on the market vary greatly in strength; indeed, so considerable is the discrepancy that the employment of these drugs in tablets by weight may become decidedly dangerous. Of three samples of supposedly C.P. strophanthin which I tested in 1897 and reported in *The Journal of the American Medical Association*, "there was found such wide variation in activity that one was ninety times as fatal to animals as another. The strength of the remaining two varied between the above limits. No two samples were even approximately the same in strength. What a chance for a sudden fatal termination of an apparently improving heart case!"

It is a well-known fact that the supplies of crude Indian cannabis, strophanthus seeds, etc., shipped to this country may possess full activity or be almost inert, resulting, consequently, in much variation in the finished products. From personal observation in testing several hundred samples of crude hemp, I find that at least 60 per cent. of the drug obtainable should be condemned. Is it any wonder that physicians have come to believe that cannabis is the most unreliable of drugs? I have frequently found one tincture of strophanthus three times as active as another. Verily the practitioner's path is full of pitfalls when he attempts to prescribe drugs of this class!

By physiologic methods, since many of these drugs have an almost specific action on certain organs of the animal body, it is

a comparatively easy matter to standardize the crude drug, pharmaceutical preparations or active constituents before they are placed on the market in the form of fluid extract, pills, tablets, etc., and thus avoid unnecessary danger to patients. I believe the time will come when the attitude of physicians will be such that manufacturers of these medicines will be compelled to purchase physiologically assayed drugs or assay their finished products by physiologic means.

Synthetic chemistry has made such rapid progress during the past few years that scarcely a day passes without our attention being called to some new antiseptic, antipyretic, hypnotic, etc. I believe the introduction of these substances will result in great benefit to the entire profession of medicine, but before a new product is employed for clinical purposes its physiologic action should be carefully studied in the laboratory. Not until the functional changes produced by the drug on each individual organ have been worked out as thoroughly as possible can a rational application of the remedy be made.

"The examination of medicinal plants for active constituents is greatly facilitated by physiologic testing of the residues obtained by chemic manipulations;" as we are unable to say whether a substance crystallizing in an alcohol extract of a plant is the active constituent of that plant, or whether the amorphous substance dissolved by ether is the principle sought, we can tell by physiologic methods when we have a substance representing the activities of the crude drug, whether it be crystalline or amorphous—which is the fact of real importance to the physician.

"Heretofore it has been the custom of manufacturing houses, when dealing with a new plant believed to possess medicinal properties of value, to make a fluid extract or some other preparation of the crude drug, and send it out to clinicians, at great expense, in the hope that it might prove of value. How much better it is to have the physiologic properties of the plant examined at the outset. If found to be inactive, the drug may be rejected, thus saving a large item of expense to the manufacturer and much disappointment to the physician and his patient; while if the plant is of value and the physician knows what its effects are on the various organs of the body, he can use it intelligently, with a good prospect of success. Then, too, human beings are not so recklessly experi-

mented upon, the lives of a few animals being jeopardized in place of so many patients. We can never analyze the action of a drug on the various organs of the human body with such precision as we can on the lower animals, but clinical knowledge obtained after we have a right conception of the physiologic action of the agent used is of very great importance in determining the value of a given remedy." (*Jour. Am. Med. Assoc.*, April 3, 1897.)

Until recently most of the work in experimental pharmacology has been carried out in Europe. A few of the better universities of America have equipped laboratories for the investigation of the physiologic action of drugs and for purposes of instruction. No American or foreign educational institution, so far as I am aware, has given attention to the qualitative or quantitative assay of drugs by physiologic methods, notwithstanding the vast amount of valuable research work they have accomplished.

It seemed to me, five years ago, when considering the advisability of establishing a pharmacologic laboratory in connection with a manufacturing plant, that an extremely important field of work was being neglected, and that by careful and painstaking study methods could be devised whereby the danger of prescribing powerful remedies unamenable to chemical assay could be avoided. Such work requires much time and ample laboratory facilities, but success can be accomplished, as evidenced by the fact that all the diphtheria antitoxin on the market is standardized by experiments on animals. Other illustrations might be cited if time permitted.

In conclusion, I believe that advances may be made in pharmacy by the application of physiologic methods, since such methods, when employed in connection with chemical manipulations, enable us to standardize potent drugs not amenable to chemical assay, improve processes of pharmaceutical manufacture, aid in the isolation of active constituents, help to a clearer knowledge of the action of drugs long employed in practice, and promote the advancement of medical science, by furnishing exact knowledge as to the action of new substances before they are employed clinically, and thereby serve the cause of humanity.

CARBOLIC ACID POISONING.—J. C. Bucher attributes the recovery of a young man, aged 18, who swallowed two ounces of carbolic acid to the full stomach of the young man and the use of the tube and nitro-glycerin hypodermically.—*Phila. Med. Jour.*

A SUBSTITUTE FOR POULTICES.

By M. I. Wilbert, Ph.G., Apothecary to the German Hospital.

As an improvement on, and a general substitute for, poultices, a mixture of kaolin and glycerin has been placed on the market, within the last three or four years, and extensively advertised, especially in the western part of the United States, under the trade-marked name "Antiphlogistine;" lately an evident imitation is being brought forward and advertised as "Antithermaline," at a slight reduction in price.

From an observation of the cases treated in a general dispensary, as well as from reports of physicians who have used the preparation, it would seem that the claims made by the manufacturers of the trade-marked article are not at all unreasonable, and that this mass or mixture will prove to be a very important and most valuable addition to our stock of remedies for local application.

It may be used in all cases where a poultice is indicated, and has the advantages of being readily applied without boiling or other preparation, of not requiring renewal for from twelve to forty-eight hours, according to the nature of the inflammation or injury, and of giving almost immediate relief from pain in most cases of acute or subacute inflammation or congestion. As a substitute for many ointments and cerates it has the advantage of not being greasy or dirty, it being readily washed off with cold water. It can readily be combined with many drugs, such as iodine, the various iodides, iodoform, tar, ichthyol and many others used in the local treatment of disease.

The manufacturers of the trade-marked article usually give quite an elaborate formula among the advertising matter supplied with each can; this formula, while practically correct, is slightly misleading, the first and last article of the formula being the component parts of the mass, as well as its active ingredients. To get a working formula for the mass, 25 grammes of antiphlogistine was taken and mixed with 200 c.c. of distilled water. This mixture was transferred to a wetted filter and allowed to drain, the mass on the filter then thoroughly washed with distilled water, the residue dried at a temperature of about 80° C., when the dry powder was found to weigh 12·3 grammes. The filtrate from the original mixture was perfectly clear and tasted aromatic and sweet, showing that the

antiseptic, aromatic oils that play an important part in the published formula, were in reality only added as flavoring ingredients.

From the information thus obtained, the following formula was adopted.

Kaolin	1,000
Glycerin	1,000
Boracic acid	100
Oil of peppermint	1
Oil of wintergreen	1
Oil of eucalyptus	2

Pass the kaolin through a No. 60 sieve to free it from sticks and coarse particles and heat to 100° C. for an hour or more to sterilize; add the glycerin and continue the heat for thirty or forty minutes, stirring the mass occasionally with a spatula, until a smooth creamy mass is obtained; remove the heat and, when nearly cool, add the boracic acid and flavoring oils; mix thoroughly, and preserve in tin or glass boxes that are fairly tight, so as to prevent the absorption of moisture from the atmosphere. The resulting product will differ slightly in color owing to a slight difference in the constituents of the kaolin, the kaolin sold in Philadelphia not containing any iron, while a lot that was obtained through a New York house did contain a trace of iron. This, however, does not affect the efficiency of the product in any way.

SOME NOTES ON CHONDRUS.[1]

By Henry Kraemer.

In this paper I desire to treat of some of the morphological characters of chondrus, its collection, as carried out on the Massachusetts coast, and some reasons for the modification of the definition of the U.S.P. concerning this drug. Chondrus belongs to what we ordinarily consider to be a low order of plants, viz.: one of the algæ—a subdivision of the cryptogams. The number of algæ, like that of fungi, is continually increasing either because more forms are being observed or because new forms are being made with the progress of time.

The algæ are divided according to whether they live in fresh water or salt water, and according to the color they possess. By the latter division we have green algæ, blue-green algæ, brown algæ and red algæ. In only one of these divisions do we have algæ in

[1] Presented at the meeting of the Pennsylvania Pharmaceutical Association, June, 1899.

which the green color is manifest; in all the others it is hidden by means of other coloring substances, to which are given the various names "blue-green," "brown" and "red." The blue-green algæ are generally found in moist soil near fresh water, seldom do they occur in salt water. The green algæ represent a rather ubiquitous group that may be said to be found anywhere where the conditions for CO_2 assimilation are present. The brown algæ, represented by Fucus, Laminaria, Sargassum, etc., reach their greatest perfection in the colder waters, as north of Cape Cod and the English channel. The red algæ attain their greatest perfection in the deeper waters.

The outer morphology of the algæ appears to be rather simple. They may consist of a single row of cells placed end to end and forming thread-like masses, as Lyngbya (called mermaid hair), or cord-like masses, as in Chorda. In some cases the thread-like filaments may branch as in Griffithsia. The same may be said of some of the algæ which are made up of a large number of cells placed side by side, as Ceramium, Dasya. In some cases the thallus is flattened, as in Chondrus, Laminaria, Rhodymenia. In some cases the parts of the plant are differentiated to such an extent that there is developed what looks like root ("hold-fast"), stem ("stipe") and leaf ("blade"), as in Laminaria. In some cases there are incrustations of calcium carbonate produced, as in Melobesia, Corallina.

In regard to manner of reproduction in the algæ we have a number of distinct kinds of sexual and non-sexual reproduction. It is not fitting that I take up these different forms at this time. In the sexual mode of reproduction we have essentially three kinds: (1) The conjugation of two cells that look essentially alike; (2) the conjugation of two cells that may be distinguished one from the other, and to which the terms male and female are applied, and (3) the remarkable condition such as we find in the red algæ, as in Chondrus, Gigartina and some others in particular, and which will be briefly described presently.

In its general outer morphology *Chondrus crispus* (L.), Stack., consists of more or less purplish-colored fronds, which are from 2 to 4 inches long, dichotomous, flat, the segments being linear-cimeate. It is attached to the rocks by a slender hold-fast, and has not infrequently been found growing upon various forms of marine life. On making a transverse section, we observe a more or less differentiated

epidermis, which may be distinguished from the remaining thick-walled cells. The fruit is known as a cystocarp, a term applied to the zygote or zygospore of the Florideæ. The development of the zygospores in chondrus is a rather interesting one as described by Schmitz.[1] Briefly stated, it is as follows: From one of the cells in the tissues of the thallus there is produced a three-celled branch which bends and almost touches the "Tragzelle." The end cell of the three becomes what is known as the carpogone cell, and develops a trichogyne, which protrudes from the thallus tissue. The Tragzelle becomes the "Auxillarzelle."

The nucleus of the spermatia unites with the nucleus of the carposporic or egg cell, and subsequently a division wall is formed between the trichogyne and egg cell. The egg cell then unites with the auxiliary cell, and from the latter there arise numerous thread-like processes which unite with some of the cells of the thallus. It is from this latter union that there is then developed a complex of four cells, which gives rise to the naked carpospores. In other words, we have here what may be termed a triple conjugation, and, in view of this condition, may we not then well ask what is fertilization? Is a certain quantity of matter required before an egg may develop its progeny, or does it mean that a certain amount of stimulation is necessary?

This brings me to say a word on the industrial side of the seaweeds. In the Old World the collecting and working up of seaweeds yields financial returns upon which a large number of people of a great many of the smaller towns are wholly dependent. In this country all along the coast one observes that seaweeds are to some extent collected and utilized as a fertilizer, but besides this use of seaweeds there is an industry of great importance to the inhabitants of a number of smaller towns between Plymouth and Cohasset on the Massachusetts coast. It is the collection of Irish moss.

The situation at Scituate is particularly good for this purpose. You find here an inlet with a fine beach, on either side of which extend rocky promontories, on the submerged rocks of which the Irish moss is found.

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[1] Untersuchung über die Befruchtung der Florideen, in Sitzungsberichten den Königl. Akad. der Wissenschaft zu Berlin, 1883.

The beach extends probably 20 feet above high tide, at the top of which the frame houses are placed; back of this there is a gradual decline to the brackish salt marshes.

The moss is collected between the latter part of May to September. June and July are the months when the greatest amount of collecting is done. The collectors frequently work during these two months from four in the morning till eight at night.

The women used to be the great helping hands in gathering moss, but fortunately for them the moss is only found on those portions of the rocks that are from 15 to 20 feet below the tide, and the only way that moss can be collected to-day is by the use of long spruce poles to which is attached a heavy iron rake.

The men go out in their sail boats or dories (row boats) at half-tide, and come in at half-flood. With their long rakes they scrape the moss off the rocks. The amount collected varies with the season, but the quantity usually gathered is about 50 pounds.

The men return with boats and cast anchor until the tide is high, when they row out and bring their dories to the highest point on the beach, thus saving considerable energy.

They then carry the moss from the boats to points higher on the beach in boxes about 2 feet square, and made of lathes. These are practically suitable trays, so that two men can handle them.

The moss is spread out on the beach and exposed to the weather for a week or so. The action of the sun and dews is to bleach the moss.

The product is turned over every few days, and at the end of a week is of a light purplish-yellow color.

It is then put into half hogsheads and covered with canvas. On clear days they roll the half hogsheads containing the moss to the brackish marshes and fill the hogsheads containing the moss with salt water. The canvas is again put on and the half hogsheads rolled up on the beach and the moss uniformly spread out on the beach to dry to be further bleached. The salt water seems to preserve the moss, as well as assist in the bleaching action of the sun.

This is then raked over, the women assisting, until dry, and the treatment repeated four or five times until the moss is of a light yellowish or white color. The more favorable the weather has been and the more successful the treatment the whiter is the product.

When fully prepared, the moss is put into barns, and in the fall is

packed in barrels, each of which holds about 100 pounds. It is estimated that about 10,000 pounds are gathered at Scituate, and that they realize about 5 cents per pound.

When making some studies on Chondrus at the Marine Biological Station at Wood's Holl, the writer was told that *Gigartina mamillosa* grew only further north. A little later I journeyed north to the fields where *Chondrus* was gathered, and I was much impressed with the fact that all of the Irish moss that was collected was really *Chondrus crispus*(L.), Stack. chiefly, if not entirely. I subsequently obtained specimens of *Gigartina mamillosa*, Ag., from Nahant, Mass. On turning to Dr. Farlow's "The Marine Algæ of New England," I find that he says that *Gigartina mamillosa*, Ag., resembles and grows usually with *Chondrus crispus* (L.), Stack., but that it is common from Boston northward. I have examined the collections of those who gather moss on the Massachusetts coast, as well as that in the shops, and am inclined to believe that the Chondrus sold is chiefly, if not entirely, *Chondrus crispus* (L.), Stack.

RECENT LITERATURE RELATING TO PHARMACY.

LAURO TETANIN.

J. D. Filippo publishes (*Arch. de Pharm.*, 1898, 601) a painstaking dissertation on the above-mentioned alkaloid found in the bark of *Tetranthera citrata*, Nees, and in other plants of the N. O. Lauraceæ. After describing plant and process of extraction of alkaloid, which is performed by dissolving an aceto-alcoholic extract of the drug in water containing acetic acid, clearing of this solution with lead acetate, making the filtrate alkaline with sodium carbonate and extraction of freed alkaloid by agitation, he reports on the chemical characteristics of the alkaloid, which was first isolated and named by Greshoff in 1890.

The substance, present in the bark just mentioned, in quantities of 0·2 per cent. to 0·4 per cent. melts at about 134° C., blues litmus paper and is feebly basic. It changes color with most of the alkaloidal reagents, the most sensitive ($\frac{1}{60,000}$) being the precipitate with Lugol's solution. Elemental analysis showed its composition as $C_{19}H_{23}NO_5$, which was confirmed by molecular weight estimations. It forms double salts with the chlorides of gold, platinum, zinc and

cadmium, as well as the usual salts, many of which were prepared and analyzed.

As preliminary in establishing structural formula, the writer prepared with ethyl iodide a crystalline product $C_{19}H_{22}C_2H_5NO_5HI$, from which the hydriodic acid was separated by sodium carbonate, additional ethyl groups were not taken up showing it to be a secondary amine. Further proof of this was shown by the phenyl thiourea product $CSNHC_6H_5$ $NC_{19}H_{22}NO_5$, formed when the alkaloid was treated with phenyl-mustard oil. The body gave no reactions of aldehyde or ketone, but did respond to Zeisel's test for the methoxyl group (OCH_3), showing three such groups. Finally, treatment with benzoyl chloride yielded a derivative containing two benzoyl groups, showing presence of two hydroxyls. This data indicates as formula of lauro-tetanin $C_{16}H_{11}$ $(OCH_3)_3$ $(OH)_2$ NH, which disproves Greshoff's idea that it was identical with berberine. The writer investigated the physiological action of the alkaloid, which is as suggested by name. H. V. ARNY.

ESTIMATION OF DENSITY OF POWDERS.

M. Vandevyver (*Ann. d. Chimie Analytique*, 1899, 3) describes an apparatus for estimation of specific gravity of powders, which has the advantage of leaving the substance intact. It consists of a flask of known weight and capacity, provided with a three-way stop-cock and a manometer, consisting of two glass tubes connected by rubber tubing. The method of estimation is a clever application of Mariott's law—manometric readings being taken before and after the weighed powder is placed in the flask, and from data thus obtained an equation is evolved. Details are useless unless accompanied by cut of apparatus, hence the reader is referred to original article. H. V. A.

PREPARATION OF STANDARD SULPHURIC ACID SOLUTIONS.

Arthur Marshall, in the *Jour. Soc. Chem. Ind.*, *18*, 4 (1899), gives a brief résumé of some of the methods proposed for making such solutions, and shows that all of them involve a number of operations, each of which is liable to introduce more or less error. He comes to the conclusion that by far the most accurate and rapid results can be obtained by basing standardizations on the very accurate densities of sulphuric acid, made by S. U. Pickering, in 1890,

Jour. Chem. Soc., 57, 64. According to this procedure, all that is necessary is to accurately determine the specific gravity of the pure sulphuric acid, at a definite temperature, preferably at 15 or 18° C., for tables are given in the original communication, which give the per cent. of acid, of certain densities, at these temperatures. Formulas are also given to make certain calculations. Experiments were also made to show that the ordinary C. P. acid was sufficiently pure to prepare accurate solutions from it.

L. F. KEBLER.

LITHIUM-AMMONIUM AND CALCIUM-AMMONIUM.

These compounds were prepared by H. Moissan, the former by passing a current of dry ammonia gas through a U-tube, containing the metal, lithium, at the ordinary temperature and pressure. The calcium-ammonium was prepared by the same procedure, except that the temperature was not allowed to rise above 20° C. These compounds have the composition represented by the formulas $LiNH_3$ and $Ca(NH_3)_4$, respectively.—*Comp. rend.*, *127*, 685.

L. F. K.

LIME AS A PRESERVATIVE OF CHLOROFORM.

D. Newman and Ramsay (*Lancet*, Jan. 23, 1897) recommended the use of lime for purifying and preserving chloroform. On the strength of this D. Brown made some experiments, and found that lime was not only not efficient as a preservative of chloroform, but, on the contrary, hastened its decomposition. Chloroform having a specific gravity of 1·500, when mixed with slacked lime showed marked decomposition, after two days' exposure to sunlight. Chloroform, whose specific gravity was reduced to 1·497 with alcohol, to which slacked lime was added, showed decomposition after similar exposure for five days, while the same chloroform, without the lime, did not exhibit any decomposition, even after several weeks' exposure.—1898, *Pharm. Jour.*, *61*, 669.

L. F. K.

CONCERNING COLOPHONY.

As a result of careful examination of rosin, R. Schick (*Ap. Zt.*, 1899, 43, from *Ztschr. f. angew. Chem.*, 1899) takes exception to Dieterich's statement that it consists chiefly of abietinic anhydride. His results in the estimation of the acid and saponification numbers

of the samples examined led him to the conclusion that the main ingredient is an ester, which is saponified by the alcoholic potassa used in the above process. He also finds that no definite iodine absorption number can be obtained, but he thinks that the index of refraction of a 20 per cent. solution in linseed oil may prove of analytical value. H. V. A.

A NEW METHOD FOR ESTIMATING FORMALDEHYDE.

O. Blank and H. Finkenbeiner, *Ber. d. Deut. chem. Ges.*, 1898, *31*, 2979, state that the ammonia process for estimating formaldehyde gives lower results than several of the other technical methods that agree well among themselves. They offer a new method, which gives very good results. It consists in oxidizing the formaldehyde, in a definite amount of standardized alkaline solution, to formic acid, by means of hydrogen peroxide, and then estimating the amount of caustic not neutralized. The method is as follows: place 3 grammes of solution or 1 gramme of solid formaldehyde into a tall Erlenmeyer flask, containing from 25 to 30 c c. of double normal caustic soda solution; then add gradually, during three minutes, 50 c.c. of 2·5 to 3 per cent. of pure hydrogen peroxide, through a funnel placed in the neck of the flask. Allow to stand two or three minutes, then estimate the amount of unused alkali, with double normal sulphuric acid, using litmus as indicator. Solutions containing less than 30 per cent. of formaldehyde must be allowed to stand not less than ten minutes, after the hydrogen peroxide has been added, so that complete oxidation will result. The per cent. of formaldehyde is found by multiplying the number of cubic centimeters of alkaline solution used, by two, if 3 grammes of substance are taken, and by six when 1 gramme is employed.

The presence of acetaldehyde, paraldehyde or benzaldehyde is liable to vitiate the results. L. F. K.

STABILITY OF OXALIC ACID SOLUTIONS.

W. P. Jorissen, *Maandbl. naturw.*, *22*, 100; from *Chem. Centrbl.* (1898), 1084. Oxalic acid solutions, in the presence of light, are decomposed by oxygen, but in the dark the solutions are stable, except that they may be decomposed by fungi. Two to three per cent. solutions are poisonous to mould fungi. Alcoholic oxalic acid solutions diminish in strength even in the dark; this is probably due to the formation of esters. L. F. K.

EDITORIAL.

FAIRS AND EXPOSITIONS.

The word fair is derived either from the Latin *forum*, a market-place, or *feriæ*, holidays. Fairs were originally meetings of buyers, and sellers with their merchandise, either at stated times (on holidays) or at fixed places (markets) for purposes of trade. Fairs, however, were not wholly given over to business, but contained certain departments for amusement and relaxation. It is supposed by some that fairs were an outcome or offshoot of the feast days of the church. It is, however, likely that the latter borrowed the term from the Romans, and that "fairs are probably coeval with commerce itself, since, especially before the era of railways and steamboats, some rallying point of the kind was necessary for the interchange of commodities. Such commercial gatherings were known in most of the states of antiquity, especially in the provinces of Rome."

The fairs of Germany, Russia, France, Turkey, India and England may be said to have been among the great educational institutions up to within the last century. To these gatherings were brought not only the merchants and financiers of all lands, but here were also to be found skilled mechanics and students of every kind. Here was a common meeting place for the interchange of thought as well as products of skill. Here were opportunities for wider visions and an examination into the resources of the minds of all nations, as well as the resources of the natural conditions of these countries and acquired skill of their workmen. These fairs cherished and preserved an international spirit in thought and commerce and wrought a gradual change upon all the labors of the minds and hands of all the nations that were represented.

It was but natural, with the construction of roads and canals and the development of commerce, that the main features of the fairs were made subsidiary to the social features and amusements, and they came to be regarded in the nature of festivals and were made holidays. Fairs, particularly in England and France, came to be more or less of the nature of "shows," or a kind of circus, and, as a result, in these countries they have, it is said, almost entirely disappeared or given way to markets for specialties. The fairs which are still continued in Europe and considered to be of greatest importance, are those held three times a year in Leipzig. The Easter "Messe" (or fair) at Leipzig is considered the most important, and still brings thither people from nearly all parts of Europe. The fairs at Nijni-Novgorod are also famous, attracting the merchants of Europe and Asia. The largest fairs probably of modern times, bringing together the largest number of people and merchandise of greatest value, are those held at Hurdwar, on the Ganges.

According to the historian Prescott, we find that on this continent fairs were held in the principal cities of Mexico. In the United States the term fair is used to include a variety of exhibitions, which are either in the nature of competitive exhibitions or festivals for charitable purposes. The agricultural fairs, so popular in the United States, were originated by E. Watson, who induced the New York Legislature to appropriate $10,000 for six years, to be expended for premiums on agricultural products and manufactures. Besides State fairs, it has been estimated that nearly one-half of the counties give annual fairs. Besides these agricultural fairs, there have been other exhibitions, as those

of the American Institute, the Franklin Institute, the Maryland Institute, etc.

The term fair is ordinarily associated in this country with agricultural or mercantile interests. While originally applied to a gathering of buyers or sellers at a particular place and a particular time with their merchandise for purposes of barter and trade, the term fair is now applied to either festivals where fancy articles are sold, usually for some charitable purpose, or it is applied to exhibitions of agricultural products, which are not primarily intended for purposes of sale, but for competitive show, where those having the best exhibits receive prizes, etc. From these competitive agricultural fairs have sprung the more specialized "shows," which are given solely for the exhibition of some one product (as chrysanthemums) or animals (as poultry, horses, etc.).

Expositions are distinguished from fairs in that they are public exhibitions of industrial or artistic productions. They may be looked upon in one sense as more refined or cultured fairs, which have resulted with the progress of civilization and the increased products of man's handiwork. The Centennial Exhibition held in Philadelphia in 1876 was, up to 1892, probably the greatest exposition held in this country. The World's Columbian Exposition, held in Chicago in 1892, while a magnificent show to the "sightseer" and of general interest to every one, was not the kind of an exposition that the student attended with profit. (See this JOURNAL, 1894, p. 80). Attention was called in that article to the fact that the expositions of the future, to have the greatest value, must be of a more specific character. They must serve rather to bring together in certain departments those results which will take the place in a certain measure of long travels and extended residences in different parts of the world. The expositions of the future will tend to become more and more in the nature of post-graduate schools for the "journeymen" of each trade or profession. The trend of modern training in every pursuit in which there is a livelihood to be made is to replace the personal investigation by such rapid methods of education. In the National Export Exposition, now being held in Philadelphia, we find such an institution, which has been called by Hon. Wm. P. Hepburn a "University of Commerce." In speaking of this Exposition, Mr. Hepburn, in his oration at the opening, said:

"It is grand and beneficent in its designs; it is comprehensive in the vast possibilities of its teachings. Here comes one of its inquiring students. He wants to engage in a commercial venture, or he wants to employ some idle manufacturing plant in making things that he can sell. He walks through the splendid sample rooms of this museum. The objects of commerce known to the world are spread out before him. Information with regard to each subject is cheerfully, quickly, accurately given him. Suppose that he desires to purchase wools. All of the wools furnished by all of the countries that export them are here for him to examine and compare. He not only examines the fibre, but is informed as to price, as to quantity of production, as to cost of transportation, insurance, commissions, exchanges, routes of carriage, all facilities for shipment, factors, agents and commission men with whom to deal; in short, here is given every item of information that he could acquire by a journey to that particular country and a personal investigation that would occupy months of time.

"As of wool, so of leather, of hides, of woods, of grain, or ores; in short,

of every conceivable article that any commercial people in any part of the world have to sell. He not only can see the raw material, but specimens of the manufactured articles of the country. If the inquirer wants to sell, or to manufacture for a particular people, he can see samples of that which they buy, or that they most desire. If there is a particular form of shoe, or a preference for colors, or for shades in textiles, he can be instructed in all of this in these ample sample rooms. To-day this institution has in every part of the inhabitable world its trained, intelligent agents, whose duty it is to study carefully the wants and resources of every people, whether they be buyers or sellers. And with the utmost fidelity they report what the buyers want, and what the sellers have; and they inform themselves with every detail that will be necessary to the conduct of an intelligent commercial transaction. They not only make these reports, but they are gathering the material for object-lessons for the eye, as you may see them in these neighboring rooms. Here, too, are gathered all of the trade journals of the world. Their important statements are culled, translated, classified and tabulated for instant use. So that, in a moment, inquiries as to articles, quantities, prices, modes of carriage, transportation prices, commissions, insurance, exchange, time of transit and all other factors of cost can be as completely answered as could be after months of travel and inquiry under the old methods of acquiring a knowledge of trade." If we study the present in the light of the past, we see how naturally present methods and institutions have been evolved and that our specializations of to-day are but the fruition of principles which long ago were started germinating.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

A TEXT-BOOK OF PHARMACOLOGY AND THERAPEUTICS, OR THE ACTION OF DRUGS IN HEALTH AND DISEASE. For the use of students and practitioners of medicine. By Arthur R. Cushny, M.A., M.D. (Aberd.), Professor of Materia Medica and Therapeutics in the University of Michigan, Medical Department, Ann Arbor. In one handsome octavo volume of 728 pages, with 47 engravings. Cloth, $3.75, net. Philadelphia and New York: Lea Brothers & Co. 1899.

A work which is inspired by the writings of and dedicated to Schmiedeberg must have in it more than ordinary value. Professor Cushny has shown in his text-book a remarkable grasp on this coming and most interesting subject, which will place the studies of the clinician and the practice of medicine generally on a more scientific basis. While appreciating sharp demarcations and the necessity for them, the author has allowed himself to present the subject in such a way that it may be considered to be the entering wedge between the old empiricism and the new way of studying the changes produced by drugs on living organisms. The work is divided into six parts, besides having an introduction. In the introduction are considered (1) the mode of action of drugs, stimulation, depression, irritation; (2) elective affinity of drugs, protoplasm, poisons; (3) remote, local and general action; (4) chemical composition and pharmacological action; (5) conditions modifying the effects of drugs; (6) methods of administration; (7) chemical characters of drugs; (8) pharmacopœias and pharmacopœial preparations; (9) classification of drugs.

In Part I those organic substances are considered which are characterized

chiefly by their local action, and includes the action of demulcents, emollients, sugars and flavoring substances, simple bitters, volatile oil series, skin irritants and counterirritants, vegetable purgatives, vegetable astringents and anthelmintics.

Part II is given to the consideration of those substances which are characterized chiefly by their action after absorption. The following substances are considered: Narcotics of the mellose series, strychnine, opium series, hydrastine and hydrastinine, cannabis indica, apomorphine, prussic acid, caffeine, curare, coniine, nicotine, lobeline, atropine, cocaine, pilocarpine, physostigmine, aconitine, veratrine, emetine, colchicine, saponin, solanin, aspidosperma, quinine, antipyretics, antiseptics, including formaldehyde, camphor, picrotoxin, digitalis series, nitrites and ergot. Part III is devoted to the consideration of the action of the alkalies, alkaline earths, acids and allied bodies. In Part IV the actions of the heavy metals are taken up. Part V is devoted to the ferments, secretions and toxalbumins, and in Part VI the menstrua and mechanical remedies are considered.

In general, we may say that in the consideration of the drugs the author gives a few general characters of them, mentions their preparations, with doses, and this is followed with the action, therapeutic uses, symptoms of their poisonous effects and a bibliography of the most important references. A careful perusal of the book shows that the author has carefully sifted the literature, digested the results of the foremost pharmacologists and therapeutists of the world, and that he has presented thereby a well-balanced, rational, scientific and practical work. The book is to be recommended to all who are interested in the use of medicines, and will, no doubt, have a large circulation, as the price is a very reasonable one.

MATERIA MEDICA, PHARMACY, PHARMACOLOGY AND THERAPEUTICS. By W. Hale White. Edited by Reynold W. Wilcox. Fourth American edition. Thoroughly revised. Philadelphia: P. Blakiston's Son & Co.

This work, which has previously been favorably reviewed in this JOURNAL, still maintains the qualities which have made it so useful as a text-book in medical schools as well as colleges of pharmacy. The present edition is the fourth American edition and has been thoroughly revised since the recent appearance of the second English edition. In addition to the rearrangement in general, the drugs of animal origin are arranged in groups showing their uses, and, in the appendix, classified according to their source. For the convenience of the student a very complete index has been prepared. The work has been carefully revised and will continue to have a large sale, as it may be considered a *multum in parvo* on materia medica, pharmacy, pharmacology and therapeutics.

SCHLEIF'S MATERIA MEDICA AND THERAPEUTICS. A manual of materia medica, therapeutics, medical pharmacy, prescription writing and medical Latin. For the use of students and practitioners of medicine. By William Schleif, Ph.G., M.D., Instructor in pharmacy in the University of Pennsylvania. In one very handsome 12mo volume of 352 pages. Cloth, $1.50, net. Philadelphia and New York: Lea Brothers & Co.

In the preface it is stated that "This volume is intended to afford a condensed yet comprehensive text-book and work of reference on materia medica, thera-

peutics and a range of cognate subjects which can be grouped with manifest advantage. In addition to the paragraphs covering the physical properties, physiological action, therapeutics and toxicology of each medicinal agent, chapters will be found on prescription writing, medical Latin, medical pharmacy and practical anæsthesia. Tables of doses, of poisons and antidotes, and of incompatibilities, together with a therapeutic index of diseases and remedies and a general index, conclude a volume which it is hoped may prove of service to practitioners as well as students. It contains in a concise, definite and assimilable form the essential knowledge required in the most complete college courses on materia medica and therapeutics."

While Professor Cushny's book, which we referred to in this JOURNAL on page 489, is evidently written by one who has had a good scientific training and strong tendencies in a pure pharmacological direction (*i. e., treating of the action of drugs*), it may be said that the work of Dr. Wilcox (also reviewed above) has a more extended treatment by one who is rather appreciative of all that enters into a knowledge of the *administration* of drugs in disease; and further, in the book of Dr. Schleif we find an epitome of not only the general characteristics and properties of drugs, but of physiological action, therapeutics, preparations and doses, and it is particularly distinguished from the other works in that the *best form of administration* of remedies is also given. Dr. Schleif shows the value of his pharmaceutical education, and the facts contained in this book refute the statement in Professor Cushny's book that "pharmacy will probably occupy a still more subordinate position in medical education as the tendency to include only one or two drugs in a prescription becomes more widely spread. As long as a dozen or more components went to make one mixture, it was of importance to know their solubility and their interactions, but with the decay of the complex prescription, the study of pharmacy by medical students certainly has become less imperative." It is not our province to say whether pharmacy should be taught the medical student, but we must add that the compounding of prescriptions is based on more than solubility, and that elegant pharmacy requires even a greater knowledge than this, and it is the art of making medicines palatable.

AMERICAN PHARMACEUTICAL ASSOCIATION.

The 47th annual meeting of the American Pharmaceutical Association was held at Put-in-Bay, Lake Erie, Ohio, on September 4-9. The first general session was called to order by the President, Charles E. Dohme, of Baltimore, on Monday afternoon at 3.45. The president introduced the Local Secretary, Mr. L. C. Hopp, who, in turn, introduced the Mayor of Put-in-Bay, who made an excellent address of welcome. Prof. J. U. Lloyd then welcomed the Association on behalf of the Ohio pharmacists, giving some of the history attached to the islands in that locality, referring to Perry's victory and calling attention to the willow tree around which his dead officers were buried after the battle. He also spoke of the peculiar geological formation of the islands, with their limestone and strontium caves, etc. Mr. Dohme invited Prof. J. M. Good, of St. Louis, to respond, and the latter paraphrased Perry's message by saying "we have met the enemy and we are theirs."

Mr. Hopp then announced the programme of the meeting, after which the President delivered his address, which contained many suggestions looking to

the welfare of the Association. In considering the objects and work of the new National Association of Retail Druggists, he said in part:

"Speaking of this cry of too many pharmacists and too many pharmaceutical colleges brings me to the subject of special interest to this Association, namely, the evidently approaching era of too many associations, and hence necessarily of too many divided interests and divided efforts for betterment in our calling.

"I think it but just and proper to enter a protest at this point against some statements which have found their way into the pharmaceutical and daily press, insinuating that this Association is not of or for the retail pharmacist, but is rather controlled by and exists for the benefit of the college professor and the large manufacturer. Such statements are as unjust as they are uncalled-for, and are certainly untrue. No one class of our members is benefited more by virtue of the American Pharmaceutical Association than another. We are all benefited as we should be if the purposes of the Association and its mission are fulfilled.

"The representation of retailers, manufacturers and teachers in one association was and is necessary to produce the beneficent effects and benefits which all must admit have already been produced by the influence of this Association, and the annual fraternal meetings of its members in the past.

"The beneficent results already attained will even be greater in the future, if we only make the proper efforts in our united strength to bring the influence of the Association to bear on the amelioration, if not the extermination, of existing evils, whilst a divided association and clannishness might fail to produce this result.

"The very good work the National Association of Retail Druggists has accomplished could in all probability have been accomplished as effectually by the American Pharmaceutical Association, provided the right men had been found to take the work in hand, and if the membership had been increased to make it a still more representative body of American pharmacists. Had the men who now dominate, lead and push the National Association of Retail Druggists been members of the American Pharmaceutical Association, and taken hold of our commercial section as they have that of the National Association of Retail Druggists, the same results, I feel sure, would have been achieved.

"Confronting the facts as they are, and not as they might have been, however, the National Association of Retail Druggists appears as a splendid and deserved success. As a sister organization, I heartily congratulate it upon its apparently certain successful mission of squelching the cutter. My highly esteemed and beloved predecessor in office, H. M. Whitney, proved to be, as he has on many previous occasions, a soothsayer and leader whose foresight was accurate and trustworthy, for in his address last year, as you will all remember, he dwelled more strongly than on any other topic upon the crying necessity of encouraging the commercial section and making the work of that section the prime object of our concern and work.

"But, ladies and gentlemen, no matter how essential it may be to foster and encourage the commercial branch of our membership and to strive with our new sister association to accomplish a reform and improvement in our business and financial relations, there is ample room left for other important aims. There is more in pharmacy and in the aims of our Association by many and many an acre than the restoration of old prices. Pharmacy is as much a

science and profession as it is a commercial calling, and its advance always has been and always must be in the channels of scientific research."

The remaining portion of the President's address was devoted to the consideration of the work of the Association through its various sections and officers. Referring to the metric system of weights and measures, he said: "Feeling confident that it is in the direction of advancement and progress to have a uniform system of weights and measures all over the civilized world, and believing that no other system equals the metric system in simplicity and practical value, I advise the continued efforts of this Association to have the Congress of the United States adopt it as the official system of weights and measures of the country. The U. S. Pharmacopœia has long since adopted it, and it would hence not be a radical departure to have the system generally adopted; certainly not as far as the pharmacist is concerned. In order that this suggestion may bear direct fruit, I would urge that our Committee on Weights and Measures, which, I think, embraces a member from each State of the United States where we have membership, make a determined effort at the next session of Congress, by either appearing before them in a body or by a central committee as large and influential as possible, and again present before the Committee on Weights and Measures of the House of Representatives and of the Senate and urge the necessity of making a move in this direction at this favorable opportunity—the beginning of a new century.

"The change will surely come about sooner or later, and we, being among the principal users of weights and measures, should certainly be active in its accomplishment, especially as our Association is and has been practically a unit in favor of its adoption.

"At the last annual meeting a resolution relative to the introduction of the metric system in medical schools was adopted, and the General Secretary was instructed to forward a copy of the resolution and the committee report to the various medical colleges. In November last the Secretary sent copies, as directed, to 235 medical schools, but replies from only four have come to hand, namely, the Woman's Medical College of New York, the Yale University Medical School, the Missouri Medical College and the Kentucky School of Medicine. Of these only the last-named was enthusiastic in tone, and promised to bring the matter up at the next meeting of the Association of American Colleges."

The President's address was referred to a committee consisting of Messrs. Henry M. Whitney, of Massachusetts; John F. Patton, of Pennsylvania, and Prof. Edward Kremers, of Wisconsin.

Professor Good then reported the names of the delegates in attendance.

Recess was then taken for the purpose of selecting members of the Nominating Committee for officers for the ensuing year.

The general session on Tuesday morning was devoted mainly to the reading of the reports of officers and committees. Mr. Geo. W. Kennedy, in the report of the Committee on Membership, stated that the number of active members of the Association was 1,306; number elected during the past year, 85; the number lost during the past year from one cause or another, 161, thus making the total membership at the present time 1,323, of whom 1,220 are active, 91 life and 12 honorary members. In the report Mr. Kennedy also referred to his closing twenty-five years of service as Secretary of the Council and of the Committee

on Membership. Upon the conclusion of the report Mr. W. S. Thompson, of Washington, D. C., moved that, in recognition of the faithful services of Mr. Kennedy to the Association, suitable resolutions be drawn and the same engrossed and presented to Mr. Kennedy. C. A. Mayo, of New York City, suggested that also a gold medal be made and presented to Mr. Kennedy. The motion was unanimously carried and a committee consisting of Messrs. W. S. Thompson, S. A. D. Sheppard and J. M. Good was appointed to carry out the wishes of the Association.

The Treasurer, S. A. D. Sheppard, then read his report, which showed the total amount of disbursements to be $6,897.25, the total amount of receipts to be $9,546.35, leaving cash on hand of $2,649.10.

C. Lewis Diehl presented a preliminary report as "Reporter on the Progress of Pharmacy." The following committees also presented their reports: That on National Legislation, through its Chairman, F. E. Stewart; on National Formulary, by C. Lewis Diehl, Chairman; Charles Caspari, Jr., presented his report as Secretary. The Committee on Nominations presented the names of the following, who were duly elected officers of the Association for the ensuing year: A. B. Prescott, Ann Arbor, President; L. C. Hopp, Cleveland, First Vice-President; W. L. Dewoody, Pine Bluff, Second Vice-President; H. R. Gray, Montreal, Third Vice-President; Chas. Caspari, Jr., Baltimore, Secretary; S. A. D. Sheppard, of Boston, Treasurer; C. Lewis Diehl, of Louisville, "Reporter on the Progress of Pharmacy;" Members of Council, C. E. Dohme, H. M. Whelpley and L. Eliel.

The Committee on Time and Place of Meeting reported, through the Chairman, S. A. D. Sheppard, in favor of Richmond, Va., and the month of May, 1900, immediately after the adjournment of the meeting of the Pharmacopœia Revision Committee, to be held in Washington on the first Monday in May.

The Committee on Prizes announced the following awards: Ebert Prize awarded to Henry Kraemer, for his paper on "The Qualitative Examination of Powdered Vegetable Drugs." The general prizes of the Association were awarded as follows: First prize to H. M. Gordin and A. B. Prescott, for their paper upon "Certain Alkaloidal Periodides and the Volumetric Estimation of Alkaloids as Higher Periodides;" second prize to J. U. Lloyd, for paper upon "Standards for White and Black Mustard Seeds;" third prize to Wm. A. Puckner, for a paper upon "The Standardization of Volumetric Acid and Alkali." There was no award of the Hager Memorial Prize. The Maisch Memorial Prize was awarded to Henry Kraemer, for his paper upon "The Qualitative Examination of Powdered Vegetable Drugs."

At the third general session the report of the Committee on Pharmacy and Dispensing was read by the Chairman, H. P. Hynson.

The following suggestions and notes were received by this Committee: E. R. Selzer advised the addition of oil of cinnamon directly to the compound chalk powder, in proper proportion, to take the place of the oil in the cinnamon water of the U.S.P. He is of the opinion that the presence of the oil will prevent fermentation in the powder, which sometimes occurs when it is not properly dried. Wm. Mittelbach was of the opinion that the compound tincture of gentian should be allowed to stand at least a year, and to undergo varying temperatures before being filtered. This procedure will prevent the usual precipitate forming after filtration. He also considered the formula for soap liniment

in the U.S.P., 1880, as preferable to the 1890 formula. Further, that elixir of iron, quinine and strychnine phosphate should not be made in large quantities, and should be stored in small bottles, perfectly filled to avoid the discoloration of the product, which, he said, is prone to become dark.

J. H. Schmidt, in preparing the effervescent solution of magnesium citrate, boils and cools the water just previous to using, and adds the syrup of citric acid to the solution *before* filtering. In this manner a "sightlier" preparation is made, and one which will remain clear. To save time in making camphorated tincture of opium, he uses 40 c.c. of the tincture instead of 4 grammes of the powdered opium.

The following formula was offered by J. F. Kiedaisch, Jr., in preparing syrup of tolu: Balsam of tolu, 1·28 ozs.; sugar, 7 pounds; water sufficient to make 1 gallon. Place the balsam of tolu in a mortar and add 1 pound of sugar, rub them together into a coarse powder, then mix with the remaining sugar. Prepare a percolator, as described under "Syrup, U.S.P., 1890," into which the mixture is placed, and proceed to percolate with distilled water, returning portions of the percolate until it runs through clear.

Mr. H. T. Cummings called attention to the necessity of thoroughly incorporating pilular extracts into pill masses. He advised that the extract be well softened with water before it is mixed with the other ingredients of the mass. He has also found the water-bath useful in dissolving the extract of licorice in making brown mixture.

The use of tincture of gentian compound as an acceptable flavoring for elixir ammonium valerianate was suggested by Chas. H. Ware. He also finds that the sugar for syrup of wild cherry is best dissolved by percolation, and has had much trouble filtering the solution of licorice for brown mixture, and asks why glycyrrhizin could not be used instead of extract of licorice.

The following formula for making cold cream was offered by Wm. Gray: White wax and spermaceti, of each 6 ozs.; expressed oil of almonds, 3 lbs.; rose water, 1 lb.; sodium borate, 30 grs.; oil of rose, 2½ drs.; oil of patchouly, 5 drops. Prepare as directed by the U.S.P. It was claimed that this formula furnishes a product which will not become rancid, and that the rose water will not separate from the base.

One of the interesting features of the report was the comparison of the files of prescriptions filled in the same locality, written by the same class of physicians, for the same order of customers, consecutively for forty years. The statistics as presented seemed to show that pharmacy had not degenerated, and that more was not required of the dispenser in the "good old days" than now. The comparison made, in connection with close observation of the required manipulation, proved beyond a question that the requirements of to-day are far beyond those of any period during the life of this Association. This statement referred to scientific attainments, ready and comprehensive knowledge and to a knowledge of technique especially.

In conclusion, the report of the committee dealt with suggestions and helpful notes for the dispensary and laboratory of the retail pharmacist.

SCIENTIFIC SECTION.

The meetings of the Scientific Section were held on Tuesday and Wednesday. Owing to the illness of the Secretary, H. V. Arny, Caswell A. Mayo was made

temporary Secretary. The first order of business was the reading of the address by H. H. Rusby, Chairman of the Section. This was devoted to the discussion of "Science in the American Pharmaceutical Association." The Chairman contended that "there is no such thing in our day as impractical theory; nothing which is good in theory but bad in practice. This is the cry of either ignorance or duplicity. Good theory in these days is always good to practice, and, if the practice be equally good, is always good in practice. The most thoroughly scientific methods are, therefore, urged as the surest and, on the whole, the most rapid means of attaining to practical ends."

The report of the Committee on the Revision of the U.S.P. was then read by the Chairman, Leo Eliel. This was a very lengthy report, and devoted in part to a summary of all the work done by this Committee. The report was referred to Dr. Charles Rice, Chairman of the Pharmacopœia Committee. There was, however, considerable discussion upon some of the recommendations contained in this report. The recommendation that spirituous liquors, etc., be dismissed from the U.S.P. was combatted by quite a number. While quite a number of the members attested that the calls for wines, brandy, etc., upon physicians' prescriptions were relatively small, probably not more than one-tenth of 1 per cent., Professor Lloyd said that more liquors were prescribed than we think, and that, as they are generally in the house, the physician does not write prescriptions for them. Professor Remington thought that it was a mistake to recommend the report of the Committee on this subject to the U.S.P. Committee, and that the Pharmacopœia is the book where the tests for distinguishing between pure brandy, etc., and the "stuff" that is frequently sold ought to be given. He would go further, even, and advise that an additional committee be appointed to investigate the subject, so that tests should be devised that the physician and patient could get the pure article desired.

Professor Remington moved that, owing to the illness of H. V. Arny, the Secretary of the Section, a letter be prepared and sent him, deploring the loss of his services at this time, and expressing the hope that he may be permitted to resume his duties, and that good health and prosperity may be abundantly restored to him. This was agreed to, and Professor Remington and C. A. Mayo were asked to draw up the same. The officers of the Section elected for the ensuing year are Frank G. Ryan, Philadelphia, Chairman; Caswell A. Mayo, New York City, Secretary; F. C. Hemm, Associate. The following papers were presented:

ADDITION PRODUCTS OF OXIDES OF NITROGEN TO SESQUITERPENES.

By O. Schreiner and Edward Kremers.

The authors have, as a result of the action of sunlight upon the sesquiterpenes, obtained certain compounds which throw considerable light upon the study of this group of organic substances.

In discussing this paper Dr. W. C. Alpers said:

"Dr. Kremers remarks on the tendency of nitroso-additive products of sesquiterpenes to form white polymers is of great interest to me. During the last year, in the course of experiments with araliene, a new sesquiterpene that I isolated from the ethereal oil of aralia nudicaulis (See this Journal, 1899, p. 370), I noticed the formation of a white mass, that I was unable to explain.

This white substance appeared when I tried to crystallize the nitroso compounds of araliene. I attributed its presence to unknown outside influences, and made no effort to determine its composition. I am now inclined to believe that such a polymer, as Dr. Kremers has described, was formed."

THE DETERIORATION OF WILD CHERRY BARK WITH AGE.

By A. B. Stevens.

The author has estimated the amount of hydrocyanic acid in barks examined at different times, as March, 1898, and March, 1899. He found a more marked deterioration in the powdered bark than in the whole bark when kept in the usual containers. He recommended that the whole fresh bark only be used in the manufacture of galenical preparations, and says that the bark is best preserved in glass or air-tight containers.

STRUCTURE AND DEVELOPMENT OF SEEDS.

By A. von Zwaluwenburg and J. O. Schlotterbeck.

The authors have examined the structure and development of seeds of cacao and cotton. The object of this work was to trace the development of the tissues in ripe seeds, and is necessary for accurate pharmacopœial descriptions.

SUGGESTIONS ON THE EXAMINATION OF DRUGS.

By Albert Schneider.

The author gave a brief general discussion of the evolution and development of the five sense organs and their use and relationship in the examination and identification of substances. The following was given as the logical and natural sequence in which the senses should be employed in the examination of drugs—sight, touch, smell and taste. Hearing is of no practical value in the examination of drugs. Attention was called to the lack of reliable standards of color and odor. The author also called attention to sensations which are erroneously named odor and taste sensations. Practical suggestions were given as to the best way of bringing out the odor and taste of drugs.

THE IDENTIFICATION OF POWDERED DRUGS.

By Albert Schneider.

The author maintained that the most reliable and permanent characteristics of drugs are the histological, as they remain constant, while color, odor and taste are subject to change. Color, odor and taste should, however, be made use of in so far as it is possible. A key to about 175 official and unofficial powdered vegetable drugs was given, based wholly upon microscopical structure as revealed through a good compound microscope.

COLOR STANDARDS OF POWDERED VEGETABLE DRUGS.

By Henry Kraemer.

The author has evolved a set of color standards representing about eighteen colors, to which the descriptions of all of the powdered drugs of the U.S.P. could be referred. The author stated that the value of this work was only in that it gave an opportunity for bringing the color descriptions of drugs in the Pharmacopœia and of writers to a uniform basis, and that the color standards could not be utilized in determining the value of drugs.

NOTES ON ODOR STANDARDS.

By W. C. Alpers.

Odors have been classified by many investigators, the oldest being Linnæus, who established seven odors, beginning with ethereal odors and ending with nauseating odors. These classifications leave the decision to the likes or dislikes of the observer, and lack scientific precision. It is necessary to take the physiological function of smelling into account. A chemical reaction takes place between the odorous substance and the secreted serum on the ends of the olfactory nerves. To substantiate this theory, the author quoted from a paper by O. I. B. Wolff, who, by means of the olfactory apparatus of the bee, and with the aid of the microscope, proved the correctness of the view. A further proof is found in the sensation caused when the ions of a weak solution of some salt held in the nostrils are gathered by means of an electric current at the two poles, one of which is formed by the olfactory nerves. In the case of NaCl and $NaNO_2$ the same sensation is experienced as when Na ions are gathered around the nerve; different sensations when Cl or NO_2 ions are gathered there.

Therefore, only volatile substances of definite composition can form odor standards, so that only one reaction may take place and only one sensation be produced. All substances whose odor depends on a series of volatile substances will produce mixed odors. The author believed that, by studying the sensations produced by definite chemical compounds, a scientific classification of odors will some day be possible.

FURTHER WORK UPON THE ESTIMATION OF ALKALOIDS AND THE ASSAY OF ALKALOIDAL DRUGS.

By H. M. Gordin and A. B. Prescott.

This paper will be printed in full in a later issue of this Journal.

DIRECTIONS FOR CERTAIN ALKALOIDAL ASSAYS.

By H. M. Gordin and A. B. Prescott.

This paper is printed in full in this Journal. See p. 462.

THE VALUATION OF DRUGS.

By Henry Kraemer.

The author considered this subject from a rather broad standpoint, and endeavored to bring into the consideration of it as many things as will assist in the solution of the problems involved. The methods considered were: (1) Chemical; (2) Physical; (3) Microscopical; (4) Biological; (5) General optical. This paper will be printed in full in later issues of this Journal.

PHYSIOLOGICAL ACTION AS A DEPARTMENT OF PHARMACEUTICAL SCIENCE.

By E. M. Houghton.

This paper is printed in full in this Journal. See p. 473.

THE COMPOSITION OF HYDRASTIS.

By A. R. L. Dohme and Hermann Engelhardt.

The authors made an examination of the drug collected in fall and spring and of the rhizome free from the roots and the roots alone as well. They

have found the alkaloid in a free state and also combined with an acid in the drug. The rhizome and roots, or rhizome free from the roots, contain nearly the same amount of alkaloid (2–3 per cent.). The rhizome and roots gathered in the fall contain less hydrastine, and there is apparently present another alkaloid which is believed to be canadine. The drug, when gathered in the spring, contains more alkaloid than when gathered in the fall. A comparison of the methods of assay proposed by Prescott, Linde and Keller showed the latter to be generally more satisfactory, and that Prescott's method required more time and gave poorer results.

THE ASSAY OF HYOSCYAMUS.

By W. A. Puckner.

The modified method of A. W. Gerrard, followed by F. X. Moerk in his work on belladonna leaves (Amer. Jour. Pharm., 1899, p. 105), was applied by Puckner to henbane. The directions of Moerk were closely adhered to with one exception : in the final extraction of the alkaloid pure chloroform was substituted for the ether-chloroform mixture, thus avoiding the formation of an emulsion, and with it the addition of stearic acid. The alkaloidal residue from 20 grammes of drug required 0·65 c.c. of decinormal acid. In a duplicate determination, 0·60 c.c. was used. The average, 0·63 c.c., indicated 0·91 per cent. of alkaloid, and corresponded to the yield obtained with Schwickerath's altered method.

THE INTRODUCTION OF SCOPOLA TO THE U.S.P.

By H. H. Rusby.

This paper was suggestive of the character of the work that ought to be performed in order to answer the query, "Is it proper to make belladonna preparations from scopola in the face of the present U.S.P. definition? Should the U.S.P. change its definition so as to sanction the use of the rhizome as an alternative?" He also urged more especially the large manufacturing chemists to use the correct name of *Scopola Corniolica*, Jacq., as displacing the frequently used generic synonym *Scopolia* (which refers to an absolutely different plant-genus) and the specific synonym *atropoides*, which violates all the generally accepted rules which it is the duty of scientific people to observe.

SCOPOLA AS A PRACTICAL EQUIVALENT OF BELLADONNA.

By S. W. Williams.

The object of the writer in this communication was not to present the results of further original investigation, which might be viewed as savoring of prejudice in favor of a position previously taken, but to direct attention to the obviously disinterested statements of standard authorities, directly bearing upon the merits of the question, and which are easily accessible to the pharmacist for verification. He said :

"To recognize an article as belladonna plaster simply because it is made from 'belladonna,' when the drug, and consequently the plaster, may vary to hundreds or thousands per cent., while declaring a standardized scopola plaster unworthy of the same title, is to needlessly sacrifice virtue and practicality, to worship a name and ignore therapeutic value, to place an ill-conceived no-

tion of pharmaceutical ethics above a rational view of practical medicine, in short, to exalt an obviously inferior over an admittedly superior preparation. This never has been and never will be the design of the Pharmacopœia."

If demonstrated merit wins, the next Pharmacopœia, by granting to Scopola official recognition, will make ethical the employment of a most valuable drug which in every practical way is an equivalent of *Atropa belladonna*, at least so far as relates to external preparations. The writer believed that the second portion of the query (viz., "Should the U.S.P. change its definition so as to sanction the use of the rhizome as an alternative?") should have an affirmative answer, because the active principle, upon which the therapeutic action of belladonna depends, is yielded in larger proportion and with greater uniformity by Scopola than by either the leaf or root of *Atropa belladonna*, and because the results of clinical tests were favorable to scopola.

IDENTIFICATION OF ORGANIC SUBSTANCES.

By E. H. Bartley.

The author offered a scheme for the identification of organic substances used in pharmacy and commonly met with in commerce. Beginning with the inspection of general physical characters, the substance is heated on a platinum foil, etc. The ultimate qualitative composition is then determined and the group of organic bodies to which the substance belongs is then determined.

DOES TARAXACUM CONTAIN AN ALKALOID?

By A. von Zwaluwenburg and M. Gomberg.

After treating the subject historically, the authors gave steps, first, in purifying solvents used, and then in the extraction of the alkaloidal-like substance. They obtained minute quantities of a substance which contains nitrogen, gives reactions with certain alkaloidal reagents, but is not alkaline. The substance does not form either amorphous or crystalline salts. The authors expressed grave doubts as to the presence of an alkaloidal substance in *Taraxacum officinalis*, L.

PREPARATION OF SPIRIT OF NITROUS ETHER.

By Joseph Feil.

The process proposed requires about fifteen to twenty minutes' time, and the manipulations are such as any one skilled in ordinary chemical manipulations can easily carry out. Sodium nitrite, 30 grammes; sulphuric acid, 20 grammes; alcohol, sufficient. The sodium nitrite and 300 grammes alcohol are placed in a liter flask with a two-hole cork or rubber stopper; in one of the openings is placed a stoppered funnel of any description, the other has a glass tube connected with an upright condenser kept cool with running water.

The sulphuric acid is placed in the funnel, the mixture is then heated until the alcohol is about beginning to bubble, the heat withdrawn and the sulphuric acid slowly added; after action ceases, heat is again applied a moment or two and withdrawn. A second repetition may again cause an action to begin; usually this does not occur, although it is best to try it.

The contents of the flask are allowed to cool and then filtered in a well-covered funnel and alcohol added to make 450 grammes. It is, of course, preferable to assay the filtrate and then dilute, but a large number of experiments gave very close results to the quantities stated.

PEPSIN TESTING.

By George H. Berdrick and L. E. Sayre.

This paper, in the absence of the authors, was read by title and referred to the Committee on Publication.

SECTION ON EDUCATION AND LEGISLATION.

This section met on Friday morning with the Chairman, A. B. Lyons, in the chair. The first order of business was the reading of the annual address of the Chairman, which dealt with a number of important questions. In it it was proposed that (1) the American Pharmaceutical Association, in conjunction with the respective State pharmaceutical and medical societies, be authorized to select the names of those who are desirable to serve as members of the State Board of Pharmacy of the respective States. (2) The requirement of the proper labelling of crude drugs for shipment should be made a matter of legislation. (3) The Research Committee consider methods of pharmacological assay in connection with their other work. (4) It is desirable for the Association to secure an endowment for the establishment of a research laboratory and an organ of publication independent of advertising matter. (5) The present method of nomenclature followed for newer medicinal mixtures be deplored. The address of the Chairman was referred to a committee consisting of Messrs. Eccles, Stevens and Reed. The Secretary then read his report, which was referred to the Council for publication. The report was a summary of all pharmaceutical legislation in the United States, and statistics relating to pharmacy in the United States.

The Secretary then read a report upon pharmaceutical statistics. Thos. F. Main spoke on "The Poison Bottle Bill," as introduced into the New York Legislature, the efforts made to pass it and what it would have cost the pharmacists if it had passed.

Two resolutions were offered independently by Messrs. Oldberg and Sheppard to the effect that it be required of candidates for examination by boards of pharmacy that they have received a college education. The resolution as proposed by Mr. Sheppard was finally accepted, viz.: "*Resolved*, that the American Pharmaceutical Association represented by the Section on Education and Legislation hereby expresses its approval of the proposition that none but graduates of recognized colleges of pharmacy be received by boards of pharmacy for examination." Those participating in the discussion were Messrs. Remington, Beal, Hallberg, Bartley, Mayo and Prescott.

It was proposed that J. H. Beal, of Scio, Ohio, be requested to report next year on a "model pharmacy law." A committee of three, consisting of Messrs. Eliel, Helfman and Ebert, was appointed to investigate the subject as to whether crude drugs are shipped without labels.

F. E. Stewart, Chairman of the Committee on National Legislation, presented a lengthy report, which was considered to be judiciously and ably prepared. In it it was considered that: "The rapid growth of commercialism during the past twenty years is a menace to the educational and professional interests of pharmacy and to the Pharmacopœia. The vocation must be practised on a basis of reciprocity, whereby all are forced to comply with professional and scientific requirements; for justice demands that every pharmacist should have an equal chance with his fellows to make a living, and he who gives away the knowledge

of his discoveries is placed at a decided disadvantage unless he also receives knowledge in exchange. In the light of these facts, let us approach the important subject before us."

In referring to the secret-nostrum trade, he said: "Our objectors fail to discriminate between property in *goods* and property in marks used to distinguish between *brands*. We have never advocated the destruction of property rights in either. What we do say is that the attempt of the secret-nostrum trade to create monopolies in the manufacture and sale of medicinal agents belonging to the public, by concealing their identity and advertising them under coined names as new discoveries, is an invasion of public rights. It is not fraud for a pharmacist to substitute an open pharmaceutical preparation of his own manufacture for a nostrum of secret composition with the buyer's consent. It is legitimate competition. All competition is substitution, and competition is what the nostrum manufacturers fear."

In considering the subject of product *vs.* process patents, the Chairman said:

"By products is not meant natural products, but those resulting from the practice of the chemist's art. Shall we grant patents for the latter when they are chemical inventions in the meaning of the patent law? The patent law requires that such products shall be the result of processes in which a higher degree of skill is displayed than what is naturally to be expected from skilled chemists in the ordinary practice of chemistry. Theoretically, it appears indeed as if the limiting of patents to processes would best stimulate competition in the devising of new processes. So far as known, however, no method has been suggested whereby under present laws the manufacturers may secure the reward due them for divulging their processes by patenting them, unless the products themselves be also covered by the patents.

"However, if the Government should conclude to limit patents to processes only, the burden of proof should be thrown upon those claiming to have invented new processes for producing the same products. This might be done by compelling the inventors of alleged new processes to divulge them by applying for patents, so that the novelty in each case may be determined by the Patent Office. It is argued with force that it is the original inventor who conducts the expensive research which points out the way. It is he who sows the seed, and unless the new process should show decided novelty, and its inventor should pay a royalty to the original inventor, great hardship would often result, for the harvest would in many instances be reaped by those who have not sown, and the original inventor would have only his trouble for his pains."

In considering the situation of the manufacturers of "proprietary pharmaceuticals," the Chairman said:

"Two suggestions have been made for the purpose of aiding the manufacturer in this connection. The first secures the final publication of exact knowledge of the invention, the latter does not. The first plan was submitted to the commission on patents and is now under consideration. The Hon. Francis Forbes, Chairman of the commission calls it a 'secret patent' system, and says that similar plans have been adopted by other countries, but have been given up. Why, he does not know, except it be to harmonize their patent laws to ours.

"The other plan suggested is known as the 'British Analytical Control.'

If adopted it would establish a voluntary censorship over the introduction and marketing of new remedies, and protect the reputation of those who manufacture the older products and preparations, as well as the new, but it does not provide for a final publication of working formulas for the benefit of pharmaceutic science."

In regard to the introduction of patented synthetics into the Pharmacopœia, the Chairman said:

"Standing right in the way of the Pharmacopœia has been the question of the private ownership of names, for the admission of private names into that work was not to be thought of. But that question seems to have been settled by the Supreme Court in the Singer sewing machine case.

"Freed from that trade-mark monopoly scheme, shall patented synthetics be made official in the U.S.P.? The objection has been urged that, being introduced by advertising their therapeutic value is problematical, but that objection no longer maintains regarding some of them which have been introduced for sufficient time to give them a permanent place in the materia medica. Another objection is the commercial prestige which will accrue to their manufacturers. This might be answered by saying that such prestige should be part of the reward given the inventor for divulging his invention by patenting it.

"If we are to indorse the application of the patent law to pharmacy so far as to sanction a limited monopoly of products resulting from the chemic art in exchange for a publication of exact knowledge of each new addition, why withhold credit and commercial prestige from the patentee? Professional men in medicine and pharmacy have advocated for years that we should use every effort to have laws placed on our statute books and enforced against medical monopolies of all kinds. We have made certain exceptions by passing the preamble and resolution favoring patents on processes. Shall we go a step further and admit patents on products? If so, where do we then stand? We stand against monopolies created by secrecy as to processes or products, but admit that until a period of civilization and enlightenment is reached permitting the enactment of laws and their enforcement limiting the manufacture and sale of medicines to those who are educated and trained as pharmacists, and forcing them to conduct their business on humanitarian grounds, the protection of the patent law to medical chemical industries is ethical and right."

After much discussion of this address, the following resolution was offered by W. S. Thompson:

"*Resolved*, That the United States Government be requested not to register as a trade-mark any word to be used as the generic or specific name of the article itself, and that symbols or figures only be registered as trade-marks."

Mr. Thompson further moved "that we recommend that the law governing the patenting of processes be amended to further protect the patentee." Both resolutions were carried and were referred to the Chairman, F. E. Stewart, to be transmitted to such of the national authorities as he may think most desirable.

R. G. Eccles moved that the Association approves of the granting of patents on products. The motion was discussed by several of the members. C. S. N. Hallberg offered a substitute, which also was discussed by a number favoring it, and finally by Professor Remington, who opposed it. Dr. Bartley then moved that the whole subject be laid upon the table, which was agreed to.

It was moved by C. S. N. Hallberg that the officers of this Section for the ensuing year be requested to prepare a plan for a basis of preliminary education for admission to colleges of pharmacy. This was amended by C. A. Mayo to read "and if possible suggest a common curriculum." After some discussion, the motion as amended was carried.

The following are the officers of the Section for the ensuing year: Chairman, C. B. Lowe, Philadelphia; Secretary, J. A. Koch, Pittsburg.

The following papers were presented:

A PLEA FOR THE INTRODUCTION OF DOSES INTO THE PHARMACOPŒIA OF 1900.

BY HARRY B. MASON.

The author concluded that "There is no good reason why doses should not be introduced into the Pharmacopœia of 1900. There are many good reasons why they should be so introduced. Pharmacists want them; physicians want them. They would tend materially to bring about that general use of the book for which it is designed and upon which its success depends. They would, by virtue of this increase in the use of the book, improve pharmaceutical practice by an inevitable increase in the prescribing of pharmacopœial preparations. Besides this, doses in the Pharmacopœia would benefit medical science. They would increase exactness and accuracy in medication. They would give the pharmacist that authoritative guide of which, as safeguard to the physician, he is in great need, and with which the Pharmacopœia, as the authoritative book of standards, should supply them. With no good reason why the step should not be taken, and with several good and potent reasons why it should be taken, will the Pharmacopœial Convention of next May refuse to incorporate doses in the Pharmacopœia of 1900? Will it refuse to do what the pharmacopœial revisers of nearly every other country have recognized as necessary, and have done?"

The paper was discussed from all sides, and Mr. Sheppard moved that it is the sense of the American Pharmaceutical Association that doses be introduced into the U. S. Pharmacopœia. This motion was carried.

USE OF THE METRIC SYSTEM.

BY H. M. WHELPLEY.

The author gave a report on the use of the metric system in 545,000 prescriptions. This report was a continuation of those made in 1897 (see Proc., A.Ph.A., p. 303) and 1898 (*Ibid.*, 452). Of the 545,000 prescriptions analyzed, 5·98 per cent. were in the metric system. This makes it that out of the 1,008,500 prescriptions reported thus far examined by the author, about 6 per cent. complied with the metric system.

USE OF METRIC SYSTEM IN BOARD OF PHARMACY EXAMINATIONS.

BY H. M. WHELPLEY.

The author gave a list of the States, territories and colonies of the United States and the use they make of the metric system.

It was found that one State (New Jersey) and one territory (Oklahoma) do not use the metric system in Board of Pharmacy examinations.

Of those Boards reporting the use of the metric system, a majority state that it is used in every examination and for each applicant.

In discussing these papers, Professor Remington remarked that it was very encouraging to notice that the metric system was being taught in many of the schools to children. F. G. Ryan urged the medical schools to make use of the metric system and teach the same. Mr. Sloan, of Indianapolis, said that the medical school in Springfield, Ill., was doing what Professor Ryan had just suggested.

THE FRAMING OF A MODEL PHARMACY LAW.

By Henry M. Whitney.

The author said: "As all laws are supposed to be made for the best interests of the people, it is assumed that a pharmacy law is for the protection of the people. (1) To secure reliable drugs, true to name; care, skill and accuracy in compounding and dispensing. (2) To prevent those not qualified and certified by State authority from claiming the right to compound, sell or dispense drugs, medicines, chemicals and poisons, to the probable injury of the people. The sale of intoxicating liquors for medicinal use, like some of the poisons, is also restricted by law, and their use in compounding and dispensing is a necessity in the drug store; we have, then, for the pharmacy law to secure and approve: (1) Competent persons, qualified to assume the responsibility of conducting a drug store. (2) Sufficient wisdom and knowledge to prevent the sale of poisons for improper use. (3) Judgment and discretion in the sale of intoxicating liquors for medicinal use. (4) A clear, comprehensive appreciation of the law, as required by statute, and positive compliance with it."

HOW CAN WE MANAGE THE NOSTRUM EVIL?

By R. G. Eccles.

The author said that the granting of trade-marks to secret nostrums is a prostitution of justice, etc. "Let us insist upon every one of the proprietors of nostrums filing the full working formula of each of their preparations before they receive the protection of a copyright. Have it sufficient evidence for conviction when three well-informed pharmacists testify that by following the directions given they can produce no such product as the one trade-marked. Insist upon the trade-mark being distinct from the name by which the mixture is publicly known. After a definite number of years permit any person to make that same mixture, and sell it by the same name, but do not permit them to imitate the trade-mark of the original proprietor. The distinction between this class of goods and genuine patented goods under such law would exist in the fact that the nostrum need not comply with any test of originality or scientific principle, but could be had by any person on anything in the shape of a mixture simply on applying for the same at Washington and paying the fee."

EXAMINATIONS.

By W. L. Scoville.

The author called attention to the personal element as a part of the subject of examinations. The inherent imperfections which are in all of us mark both our opportunities and limitations, and it would seem that a frank acknowledgment of these qualities may lead not only to the avoidance of certain errors, but to the discovery of new methods and a higher degree of justice.

COMMERCIAL SECTION.

In the absence of the officers of the Section, H. P. Hynson was made temporary Chairman and Charles A. Rapelye, Secretary. In taking the chair, Mr. Hynson referred to the fraternal spirit that existed between the American Pharmaceutical Association and the National Association of Retail Druggists. The Chairman of the Executive Committee of the N. A. R. D., Mr. Holliday, was called upon and explained the work of that Association. He stated that the work of the Association is done through the representatives of the local organizations, and that the N. A. R. D. desired to be "set right" and to have the support of every one interested in pharmacy. Professor Good, one of the delegates of the A. Ph. A. to the N. A. R. D., who contributed very materially to the placing of the organization on a good foundation, also made a short address. Various other speakers from different sections of the country attested to the value of organization, and showed how they were enabled to maintain prices, etc. The whole tone of the meeting of this Section was that the condition of pharmacy was improving, and that the outlook of the commercial as well as professional sides of pharmacy was hopeful and encouraging. The officers of the Section for the ensuing year are James M. Good, Chairman; Chas. A. Rapelye, Secretary; F. W. E. Stedem, Associate.

SOCIAL FEATURES.

On Monday evening the President's Reception was held in the hotel. On Thursday most of the members went to Cleveland, by boat, and, after a carriage drive, took dinner at one of the hotels, returning to Put-in-Bay in the evening. On Wednesday evening Prof. John U. Lloyd gave a reading of selections from unpublished manuscripts of his book entitled "Stringtown on the Pike," being Northern Kentucky descriptions and folklore. This was one of the most interesting features of the meeting. In between the reading of the selections, Mrs. Joseph Feil and Miss Olinda Voss rendered some vocal solos. On Sunday about 100 of the members went to Detroit and were entertained by Parke, Davis & Co. On Monday morning the party rode to Parke, Davis & Co.'s laboratories and went through their establishment. It was indeed an opportunity for the members to see the methods of exactness and the degree to which specialization is carried out in a modern manufacturing laboratory whereby are ensured uniformity of products, skill in manipulation and the greatest possible returns for every expenditure of energy. What probably most interested the party were the biological laboratories, where the pharmacological work is carried on and where the various serums and antitoxins are prepared. In the afternoon the party was driven in tally-hos through Detroit, visiting Belle Island and other places of interest. So much was the trip enjoyed that after dinner a formal set of resolutions was prepared and signed by all the members, in which due acknowledgment was made of the appreciation of the members of the hospitality of Parke, Davis & Co.

FINAL GENERAL SESSION.

The minutes of the previous general session and of the Council were read and approved. W. S. Thompson presented, on behalf of the Association, a gold badge with suitable inscription to Mr. Kennedy, the Secretary of the Council, in commemoration of the completion of twenty-five years of faithful service to

the Association in that capacity. Mr. Kennedy, in replying, thanked the Association for the honor it had conferred upon him, and hoped always to merit such recognition from the Association.

The following resolution, prepared by Jos. P. Remington in compliance with the instruction of the Council, had been adopted by the Council and appeared in the minutes of that body and also read and adopted by the general session:

"The American Pharmaceutical Association, desiring to express its high appreciation of the distinguished services of our eminent member, Edward Robinson Squibb, M.D., to American pharmacy, and in commemoration of the eightieth anniversary of his birth, July 4, 1899, offers to him its most hearty congratulations. His long and arduous labors for the advancement of pharmacy, his high standards of professional practice, and his unselfish devotion to the highest ideals, have endeared him to every member. That many years of usefulness and continued good health may be vouchsafed to our honored member is the unanimous hope and wish of this Association."

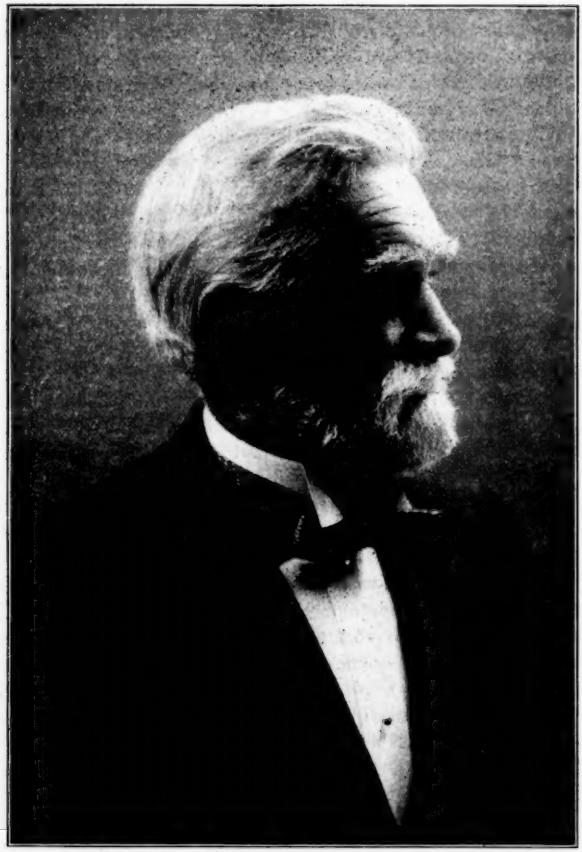
The Committee to report on ex-President J. U. Lloyd's 1888 address presented a lengthy report through the Chairman, H. M. Whelpley. In it it was stated that some of the suggestions apropos then, are out of place to-day, and that some of the propositions contained in the address have since been before the Association and acted upon.

F. G. Ryan, Chairman of the Committee on Weights and Measures, reported that, while no action had been taken by the last Congress, there was a visible growth in sentiment regarding the adoption of the system. Mr. Hynson stated that if commercial houses, in sending out their goods, would give the quantities in the metric system, an important educational work for the system would be done. C. S. N. Hallberg suggested that the Committee devise a system of popular metric equivalents, as metric pint, metric pound, etc. J. P. Remington urged every member to support the Committee in its work by enlightening the members of Congress and others on the needs of the sanction by the Government of the metric system. Mr. Reed said that all arguments in favor of the adoption of the metric system are of little avail compared to the possible universal use of the system. Mr. Sheppard then moved that the Association direct the attention of commercial houses to the advantages accruing from sending out goods in packages based on metric weights and measures. Various other reports were read, and in connection with the report of the Committee on the Semi-Centennial Celebration of the American Pharmaceutical Association in 1902, Mr. Albert E. Ebert directed the attention of the Association to the fact that one of the founders of the American Pharmaceutical Association, and the "father of American pharmacy," William Procter, was being to some extent forgotten by this generation, and that it would be well for the Association to do something at that time to revive his memory. The session was concluded with the installation of officers for the ensuing year.

NATIONAL ASSOCIATION OF RETAIL DRUGGISTS.—The first annual convention of the Association will be held in Cincinnati, beginning at 10 o'clock, Tuesday morning, October 3d. The meeting will be held in Assembly Hall, Odd Fellows' Temple, Seventh and Elm Streets. The headquarters of the Association will be the Grand Hotel, Fourth Street and Central Avenue, opposite the Central Union Depot.

PERSONAL.

Albert Benjamin Prescott, President-elect of the American Pharmaceutical Association, is best known as an author and investigator in chemistry and an educator in pharmacy. He was born in Hastings, N. Y., December 12, 1832. He studied both medicine and chemistry in the University of Michigan, and in 1864 entered the medical service of the army, commissioned as assistant surgeon in the general corps, known as the United States Volunteers. He was



ALBERT BENJAMIN PRESCOTT.

assigned to duty on the Board of Examination for contract surgeons, and was surgeon-in-charge of Foundry General Hospital, Louisville, Ky. In 1865 he entered upon college teaching, in which he has been engaged up to the present. From the organization of the School of Pharmacy of the University of Michigan, in 1868, he was an active promoter of laboratory methods in phar-

maceutical education. While director of the chemical laboratory and professor of organic chemistry for all departments of the University, he has served as the dean of the department of pharmacy. Since 1880 his work as a teacher has been devoted almost exclusively to his chosen subject, organic chemistry. His students represent nearly every department of the University. He speaks slowly and concisely, voicing the knowledge he has to impart in unmistakable terms.

His success as a teacher may be best stated by quoting the words of one of his pupils, who said that he had listened to "many teachers, both in this country and in Europe, but had found none who excel him in clearness of expression, so that ideas can be readily grasped by the student." Dr. Prescott is a very busy man, accomplishing a great amount of work without apparent haste, and yet he is never too busy to patiently and carefully explain the minutest point to a student seeking after knowledge.

In research his subjects have mostly been taken from organic and analytical chemistry. In the pharmacopœial revision of 1880, Dr. Prescott was chairman of the sub-committee on descriptive chemistry, and prepared the directions for volumetric estimation upon their introduction into this work. This year he has written the chapter upon alkaloids for the forthcoming American Text-book of Toxicology. Professor Prescott is a member of many scientific societies. He is President of the American Association for the Advancement of Science and a councillor in the American Chemical Society. As to the American Pharmaceutical Association, Dr. Prescott expresses his conviction that it has a future of great good before it. It is a body of able and devoted workers, bent upon the support of scientific investigation, the maintenance of sound commercial principles and the union of all the interests of pharmacists in this country.

OBITUARY.

SIR EDWARD FRANKLAND, one of the most distinguished of English chemists, died on August 9th, in Norway, where he had gone for recreation.

He was in the seventy-fourth year of his age, having been born at Churchtown, near Lancaster, in 1825. His preliminary education was obtained at the Lancaster Grammar School, and his studies in chemistry were pursued at the Museum of Practical Geology, in London, under Playfair, and in the laboratories of Liebig and Bunsen, at Giessen and Marburg.

To Frankland has been ascribed the hypothesis of the atomicity of the elements, his views regarding this subject having been communicated to the Royal Society in 1852. These were based on deductions from his studies of the organo-metallic compounds, bodies formed by the union of a positive organic radicle with a metal. His discovery of these compounds was made in 1850, when he announced the preparation of compounds of zinc with ethyl and methyl, and predicted the existence of other similar bodies. In 1851 he was appointed professor of chemistry at Owens College, Manchester, and it was at this time that he began his work in applied chemistry, his most important contributions to this subject being those on the questions of water supply and sewage. In company with Tyndall, he spent a night on the very summit of Mont Blanc, in August, 1859, for the purpose of determining whether the rate

of burning of bodies requiring a supporter of combustion is independent of the density of the atmosphere in which they are burnt. This question was answered in the affirmative. In addition to his other investigations, physiological chemistry likewise received a share of his attention.

Frankland's scientific attainments won for him the highest honors in his own country, and many honorary distinctions from abroad as well.

ANTON SCHÜRER V. WALDHEIM, the most prominent representative of Austrian pharmacy, died at Vienna, on August 13th, in the seventieth year of his age.

Waldheim was born in Vienna, and his education was obtained in the schools of that city. In 1846 he finished a course at the Academic Gymnasium, after which he applied himself to the study of philosophy for two years. Meanwhile (in 1846) he also took up the study of pharmacy in his father's Apotheke, and from 1852 to 1854 attended the course in pharmacy at the University of Vienna, receiving the degree of master of pharmacy in the latter year. Later on he served in pharmacies in Dresden, Paris and London, and in 1856, on the death of his father, took charge of the latter's Apotheke in Vienna, which he held during the remainder of his life.

Waldheim was officially connected with a large number of organizations for promoting the interests of pharmacy, and for more than thirty years devoted himself, at the sacrifice of much time and money, to this cause. He was the chief spirit in the movement for the adoption of an International Pharmacopœia, and this undertaking failing in its accomplishment, he became an advocate for the adoption of an International Pharmacopœia of Potent Remedies, and was a member of the committee for carrying out plans for the organization of an International Pharmacopœia Commission. He was the representative of the Austrian Apotheker Verein at the International Pharmaceutical Congresses at Paris (1864), Vienna (1868), St. Petersburg (1875), London (1881), and at Brussels (1885). At the latter Congress he was also the representative of the Austrian Government, and submitted to the Congress the draft of an International Pharmacopœia. At St. Petersburg he was the President, and for his services in this capacity was made a knight of the Russian Order of St. Ann. He was also a knight of the Franz Joseph Order of Austria.

He was an honorary member of various Continental pharmaceutical societies; the Pharmaceutical Society of Great Britain, the British Pharmaceutical Conference, the American Pharmaceutical Association, and in 1889 was elected an honorary member of the Philadelphia College of Pharmacy.

NEW ECONOMICAL PLANTS OF EAST AFRICA.—One of these is a tree of the N. O. Apocynaceæ, viz., *Mascarenhasia elastica*, K. Schum., which yields caoutchouc. Another is *Canarium Liebertianum*, Engl., the bark of which yields a resin that much resembles olibanum. Another is *Erythrophloëum guiniense*, Don., the wood of which is valuable and the bark contains erythrophloëin. The fruit of *Cordyla africana*, Lour., yields an edible leguminous fruit.—*Notzbl. d. Berl. bot. Gart.*, 1899.

UNGANDA ALOES.—W. A. H. Naylor and J. J. Bryant (*Pharm. Jour.*, 1899, p. 296) find that Unganda aloes approximates in character and tests to Cape aloes.